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(Edited Version 1996)

IV Standard

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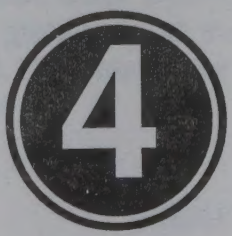
SCIENCE

for

IV STANDARD

EDITED VERSION

1999



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FOREWORD

This book has been prepared according to the New Syllabus framed in the light of the New Education Policy of 1986. The core elements and human values that are stressed in the policy have been kept in view in developing lessons.

The Directorate is grateful to all those who have been involved in the production of this book and to the publishers who have brought out this book in time. Suggestions for improvement are welcome.

Bangalore - 560 004
March 1993

Y.R. Achyuta Rao
Director of Text Books
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FOREWORD

This book is prepared as per the syllabus framed in accordance with the National Policy on education 1986 (N.P.E.). Lessons have been selected keeping in view the core elements of human values stressed in the N.P.E.

The Text Book is reprinted after editing and making necessary corrections. The Directorate is grateful to all those who have assisted in producing and editing the books. The Directorate welcomes suggestions for further improvement of the book.

Bangalore
15-2-1999

Director
DSERT & TEXT BOOKS
Bangalore

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1. LIVING THINGS

1.1 Parts of a plant

You have already learnt that there are living and non-living things around us. You see a number of plants and animals. They are all living things.

If you go to a garden, you see a number of plants and trees. If you observe a plant, you can see various parts such as stem, leaves, flowers and fruits. The parts of the plant above the soil form the shoot system. Some parts of the plant are inside the soil. You can see them only when you pull out a young plant carefully. You can't easily pull out a plant because it is fixed firmly into the soil. The parts below the soil form the root system.

The roots absorb water and mineral salts from the soil. They also fix the plant firmly.

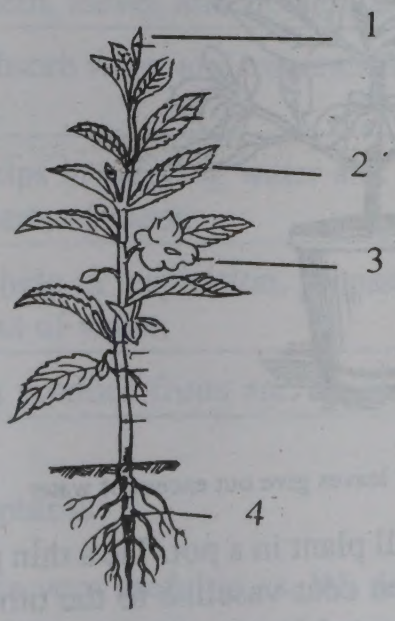

Fig.1.1 : Parts of a plant
1. Stem; 2.Leaf; 3. Flower; 4. Roots.

Activity 1.1 : Pull out a Balsam plant carefully along with the roots. Wash away the soil particles. Keep the plant in a beaker containing coloured solution in sun light for sometime. What do you observe ?

You can see that the coloured

solution rises in the plant through the roots and stem. It gets transported to the upper part of the plant.

The stem carries the water and minerals from the roots to the upper parts of the plant.

There are leaves in the plant. They have different shapes and sizes. Usually the leaves are green in colour. They look green in colour because they have a green pigment, called chlorophyll.

The leaves help the plants to prepare their food.

Leaves help in giving out excess of water in plants.

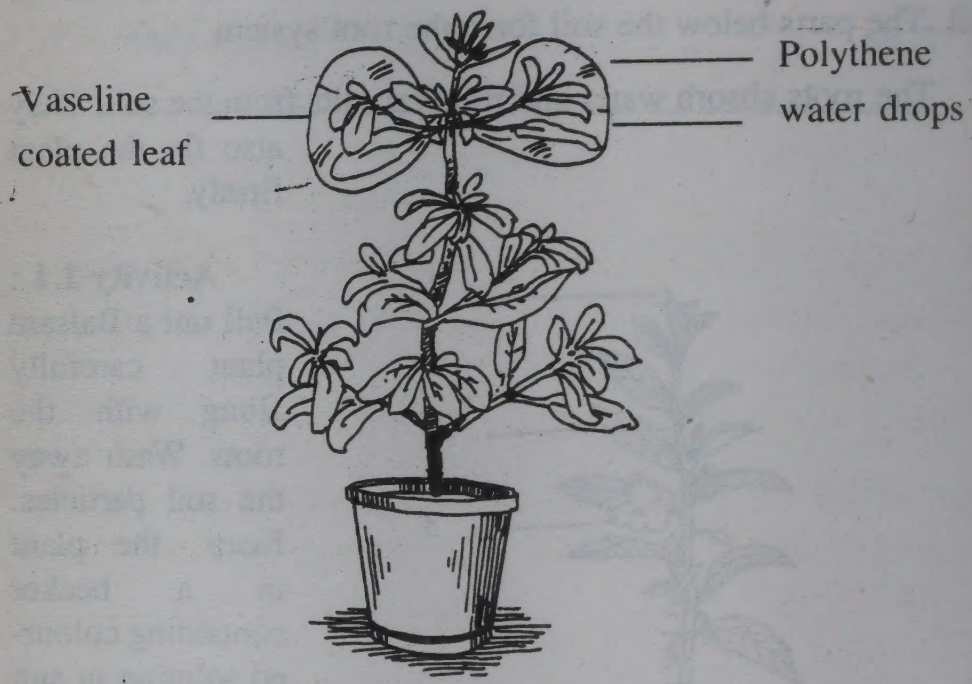

Fig. 1.2 : To show that leaves give out excess of water

Activity 1.2 : Take a small plant in a pot. Tie a thin polythene bag around a few leaves. Then coat vaseline to the other leaves. Tie a polythene bag to the coated leaves. Keep the plant in the sunlight for some time and observe.

You can see the water drops coming out from the leaves that are not coated. The leaves coated with vaseline do not give out water drops.

Do you know why this happens?

This is because the leaves of plants have tiny pores on their surface. Water comes out from these pores. If the surface is coated, then the pores close and water does not come out.

You have observed the colourful flowers in plants. What is the function of flowers? Why are they so coloured?

Flowers help to produce fruits and seeds. The bright colour of a flower attracts insects.

	Points to remember
1.	Root, stem, leaves and flowers are the parts of the plant.
2.	Roots absorb water and minerals from the soil and in fixation of plant.
3.	Stem helps in carrying water and minerals from roots to the upper parts of plant.
4.	Leaves help in respiration, preparation of food and removal of excess of water.
5.	Flowers produce fruits and seeds.

1.2 Uses of plants

Plants are very useful to us. We depend on the plants for our food and shelter.

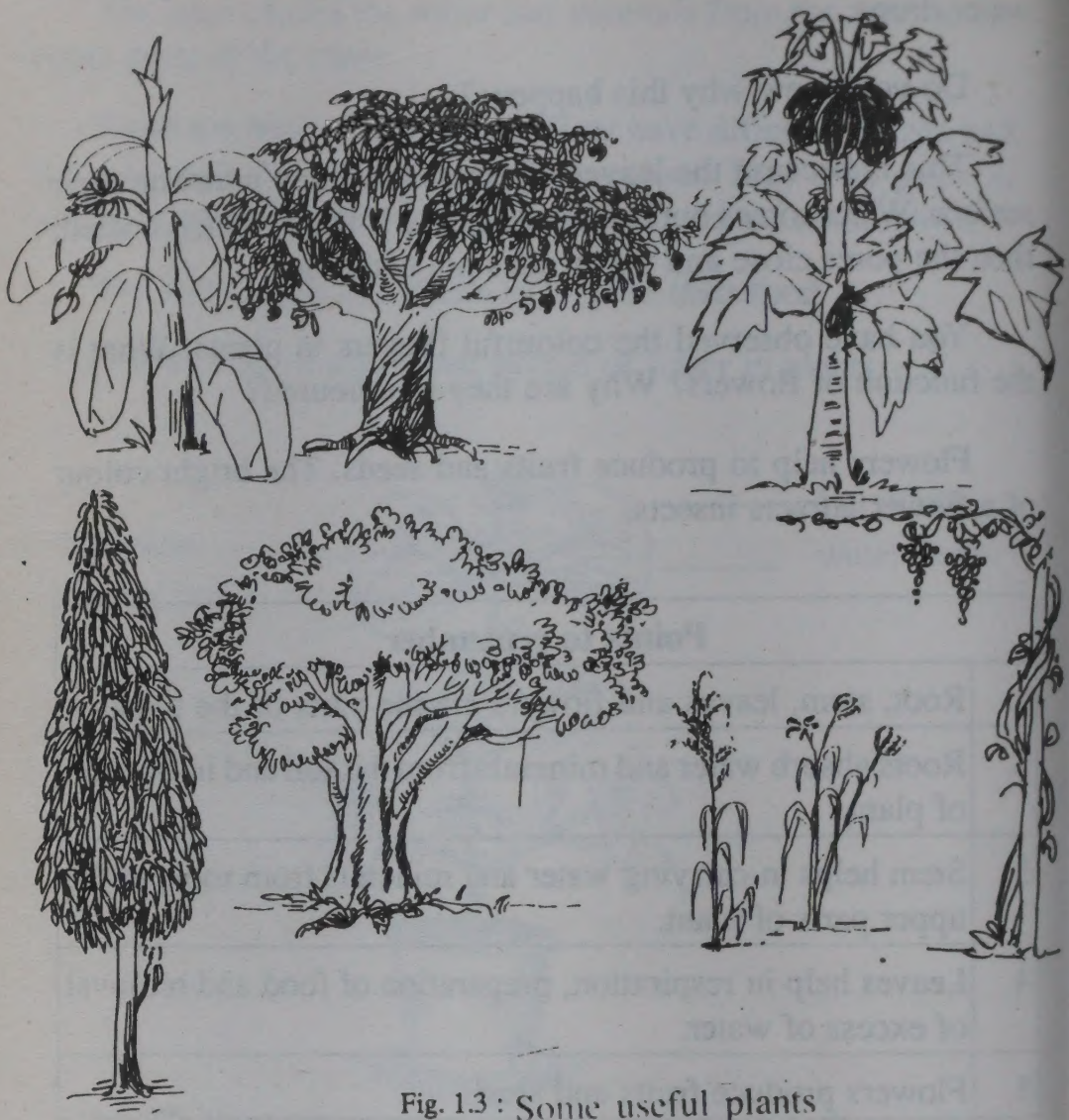

Fig. 1.3 : Some useful plants

A. Food from Plants

We get food from many plants. They are cereals, pulses, fruits etc.

The cereals are wheat, jowar, paddy, ragi. The pulses are dals, peas, bengalgram, horsegram.

Activity 1.3 : List out food items from plants that you eat every day.

Tomato, potato, cabbage, beetroot, carrot etc. are some vegetables.

The common fruits are apple, mango, grapes, banana. Fruits and vegetables are good for our health.

Activity 1.4 : You might have eaten various fruits. List out the fruits you know.

B. Fodder

The green and dry leaves of plants like ragi, jowar, bajra and paddy are directly eaten by the animals. Horsegram is a rich food for the horses.

C. Wood and timber

We get valuable wood and timber from the plants. Teak, Rosewood, Neem trees are very useful in making the furniture and in the construction of houses.

The Sandal wood gives Sandal oil. It is very valuable.

D. Fibre from plants

We get fibre from cotton, coconut and jute plants. Fibre helps to make clothes, ropes, coirmats and bags. Synthetic fibre is made from eucalyptus plants.

E. Medicinal plants

Some plants help us to prepare medicines. Leucas and ginger cure cold and cough. Neem is used for treating skin diseases. Cinchona helps to cure the malarial fever.

Activity 1.5 : List out the other plants you know which give us medicines.

The dead and decayed parts of the plant become natural manure for growing plants.

	Points to remember
1.	Food grains are obtained from the plants.
2.	Plants give us fruits and vegetables.
3.	Plants provide fodder for domestic animals.
4.	Timber, fibres and medicines come from the plants.

1.3 Uses of Animals

Look at the picture. These animals are useful to us. The ox is used to pull the cart and to plough the fields.

You know the cow, sheep and goat. How are they useful to us?

When you feel very cold during winter, you wear warm clothes. These warm clothes are made from the wool of sheep.

Have you seen beating of drums on special occasions? The drums are made up of skin of cow, sheep or buffalo. Various leather articles such as chappals, shoes, belts are made from the leather of the animals.

The dung of animals is used as manure.

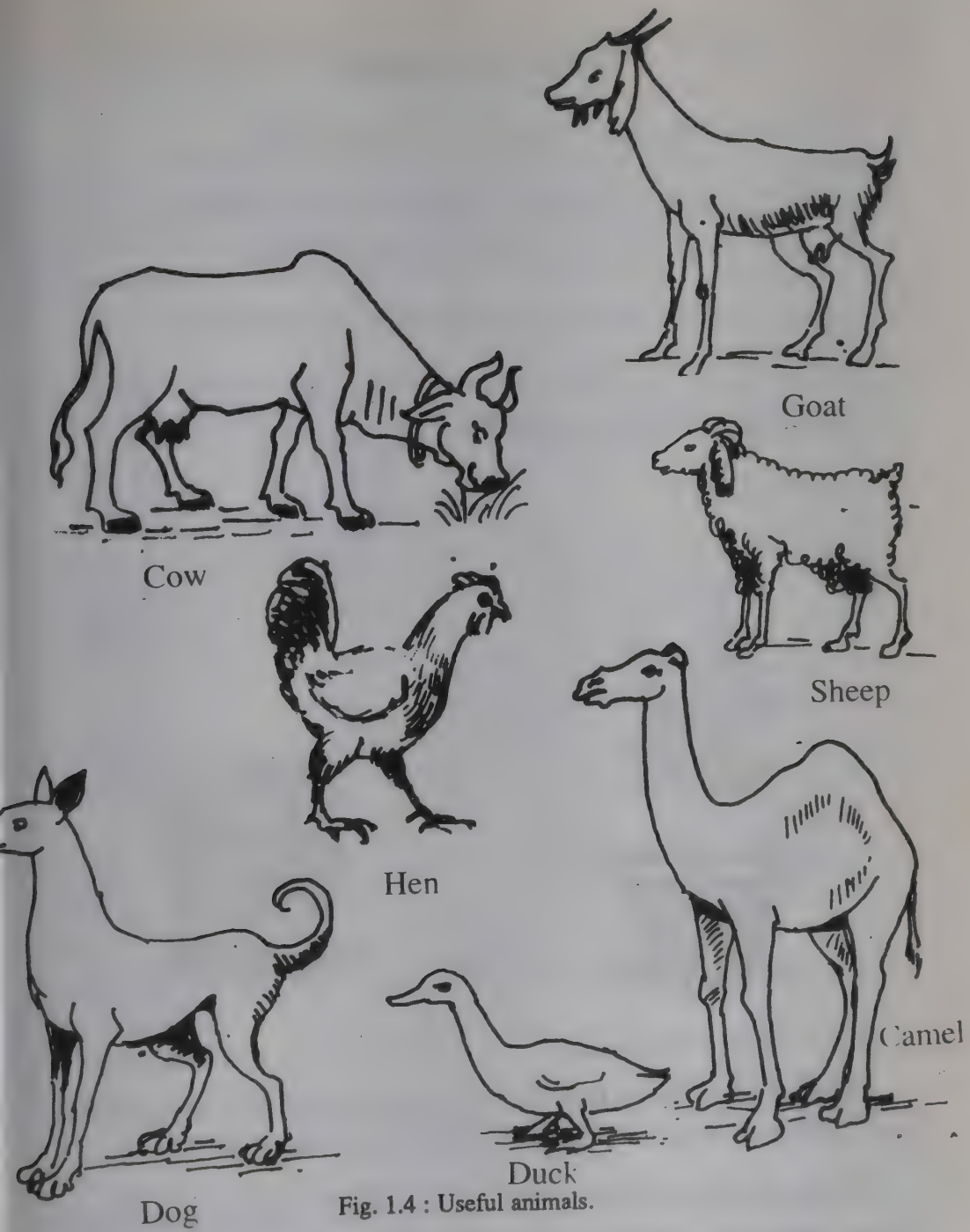

Fig. 1.4 : Useful animals.

Honey is collected from honey bees. Silk fibre is obtained from silkworm.

Points to remember	
1.	You get milk, wool and leather from animals
2.	Animals are useful in farming and transportation.
3.	Animals are the source of food for mankind.
4.	Honey is obtained from honey bees and silk fibre from silkworm.

1.4 Dispersal of fruits and seeds

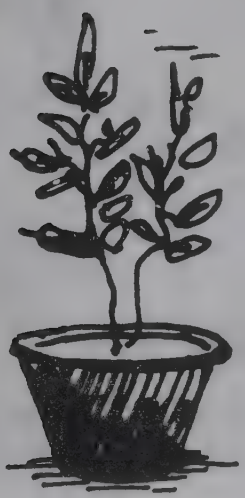

Fig. 1.5 (a) Pot with few plants

Fig. 1.5 (b) Pot with many plants

Observe the above figures. The plants in pot (a) have grown well. Whereas in pot (b) plants are poorly grown. Why?

Since the pot (a) has only a few seedlings, they get sufficient space, water and sunlight. In nature, the seeds and fruits move away from the mother plants in order to get sufficient space, water and sunlight. This process is known as dispersal of fruits and seeds.

You might have seen the seeds of cotton or plant fly in the air.

If you observe carefully, you will find that the seeds have hair like things. They help the light seeds to float in the air and carried away by the current of wind to the distant places and get dispersed.

Fig. 1.6 : Special structures of seeds.

Some seeds have special structures and by the help of these dispersal takes place.

Some seeds are dispersed by water. Example: coconut, arecanut.

Poppy and cocklebur have hooks or thorns. They get stuck to skin of animals and get dispersed.

Fruits like fig, guava, mango etc. get dispersed by animals.

In some plants, the dispersal takes place when the fruits burst.

Example : Beans, Lady's finger, Castor, Balsam.

Points to remember	
1.	Dispersal of seeds help in growth of healthy plants.
2.	Air, water and animals help in dispersal of seeds.

Fig. 1.7 : Destruction of forest

1.5 Protection of plants

You have studied that plants are very useful to us. We depend on the plants for our food, clothes, medicines, timber etc.

1. Hence we should protect the plants.
2. Plants should be protected from the weeds. They are harmful and should be removed.
3. Plants are attacked by pests and get various diseases. This can be prevented using pesticides and fungicides.

Points to remember	
1.	Plants need care and protection.
2.	Plants are protected from disease by using pesticides.

1.6 Protection of pet animals

Cat, dog, sheep, cow and some birds are the pet animals. Just as we care and protect the plants, we have to protect and take care of our animals.

1. They have to get clean drinking water.
2. Animals are usually kept in sheds. The sheds should be cleaned. They should not be exposed directly to heat and cold. The area should be kept free from disease producing germs and mosquitoes.
3. We should preserve the animals.

Points to remember	
1.	Care and protection of animals are very important.
2	Animals should be protected from heat and cold.
3.	Killing of animals should be avoided.

EXERCISES

I Mark the statements with (✔) when they are true and with (X) when they are false.

1. Roots absorb sunlight.

2. Milk is a nutritious food.

3. We do not depend on plants.

4. Snakes are harmful to us.

5. Gunni bags are made from the coir.

II Fill in the blanks by choosing the correct answers given in the brackets.

1. Leaves help plants in the preparation of _____
(fats, food, minerals)

2. We get fibre from the _____ plant.
(Neem, cotton, leucas)

3. Dried stems of _____ are used as fodder to animals.
(coconut, neem, paddy)

4. Cotton seeds are dispersed by _____
(water, animal, air)

III Fill in the blanks

1. _____ is a good food for horses.

2. _____ is a fertile manure.

3. _____ plant help us in medicine.

4. Flowers produce fruits and _____

IV Match the following :

A	B
1. Leaves	a) By the wind
2. Leucas	b) Is a fertile manure
3. Cowdung	c) Medicinal plant
4. Yakka	d) Green in colour.

V Answer the following :

1. What are the functions of stem?

2. Name some plants which give us food grains.

3. Mention the animals that give us leather.

4. How are seeds dispersed?

5. What are weeds?

6. Why should animals be protected?

VI Things to do.

1. Visit a garden and make a list of the plants you see.

2. Visit a fruit market and make a list of various fruits available.

3. Visit a milk dairy and observe the process of making the milk products.

4. Collect pictures of seeds dispersed by wind.

5. Visit a veterinary hospital and know how animals are cared.

2. HUMAN BODY - NUTRITION AND HEALTH

2.1 Human body - A Machine

You have seen a bicycle. It has a number of parts. Likewise, our body is also a machine with a number of parts. Each part of our body is called an organ. All organs perform their own function.

Activity 2.1 : List out the different external parts of our body that you have studied and mention their functions.

Sl. No.	Organ	Function

Sense organs : Eyes, Ears, Nose, Tongue and Skin are our sense organs.

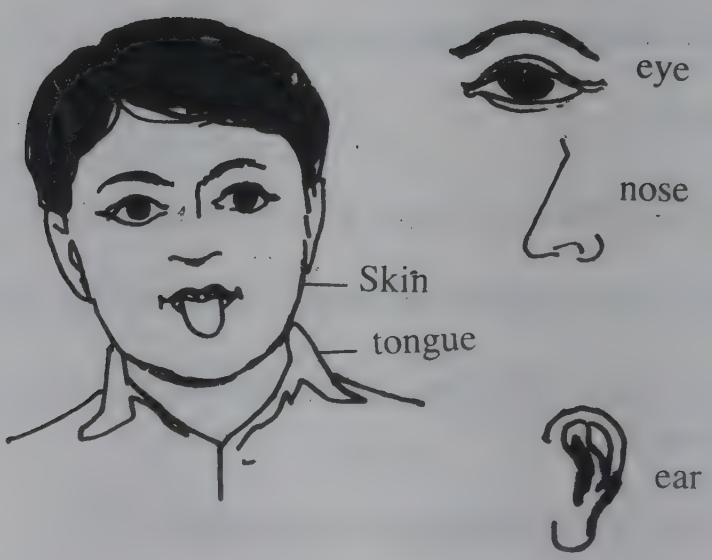

Fig. 2.1 : Sense organs

Eyes help us to see things. Ears help us to hear. Nose helps us to smell. Tongue helps us to taste and the skin helps us to feel the touch.

Activity 2.2 : Taste some pickles, tamarind, sugar candy and a neem leaf. How do they taste? Write on the table below.

Sl. No.	Item	Taste
1.	Pickles	
2.	Tamarind	
3.	Sugar Candy	
4.	Neem leaf	

You taste saltish, sour, sweet and bitter. These are the four basic tastes.

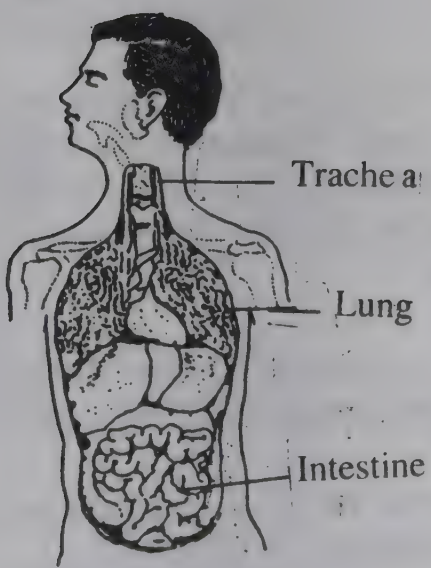

Fig. 2.2 : Internal organs.

Observe the figure 2.2. You can see a number of parts inside our body. These are called internal organs.

Identify the heart, lungs, stomach and intestines in the figure 2.2 and label them.

Fig. 2.3 : Human heart

Activity 2.3 : Keep your ear on the chest of your friend. You will hear a sound. Where does this sound come from? This sound comes from the heart. The heart lies in between the two lungs in the chest cavity. It pumps blood and helps in circulating the blood in our body.

Look at the picture. It shows the organs that help in breathing. Nose, wind pipe and lungs are the organs which help in respiration.

When you run or do any hard work for a long time, your respiration and heart beat increases.

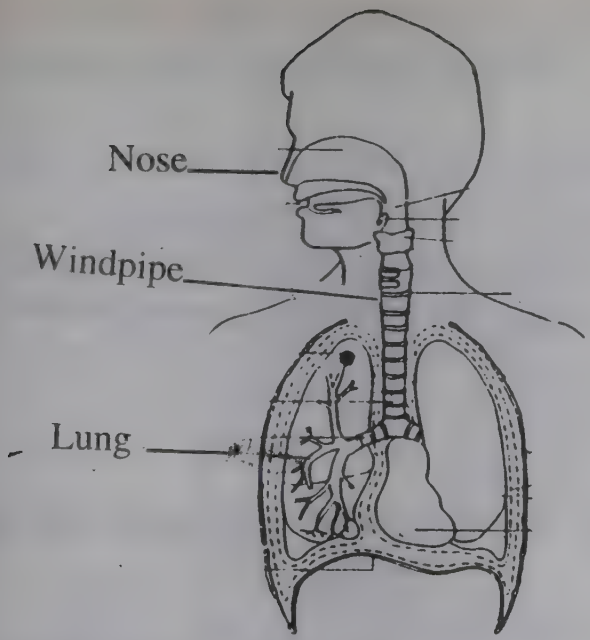

Fig. 2.4 :Respiratory organs in man.

The process of taking - in of air into the lungs is known as breathing - in or inspiration. During inspiration the chest expands and moves forward.

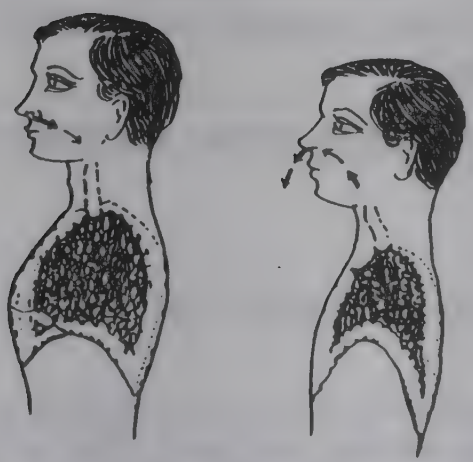

Fig. 2.5 : Showing inspiration and expiration

The process of expelling air from the lungs is known as breathing out or expiration. During expiration the chest contracts and becomes normal.

Organ system : Mouth, stomach, small Intestine, large 2 Intestine liver and pancreas help digestion

They are collectively called digestive system. Likewise there are many organ systems in our body. Each system performs its own function.

Example :

1. Respiratory System : Nose, windpipe and lungs help in respiration.

2. Circulatory System : Heart and the blood vessels help in circulation of blood.

Points to remember	
1.	Eyes, ears, nose, tongue and skin are sense organs.
2.	Lungs, heart, stomach, intestine are the internal organs of our body.
3.	When we perform hardwork the breathing rate and heart beat increases.
4.	Group of many organs become an organ system.

2.2 Our food

We need energy to do work. Food provides us energy.

Observe the different food stuffs present in the picture. They contain substances useful to our body. They are called nutrients. They are classified into five groups. They are :

Fig. 2.6 : Different food stuffs.

1. Carbohydrates
2. Proteins
3. Fats
4. Minerals and
5. Vitamins

These nutrients help in growth of the body. They protect the body from diseases and also provide energy.

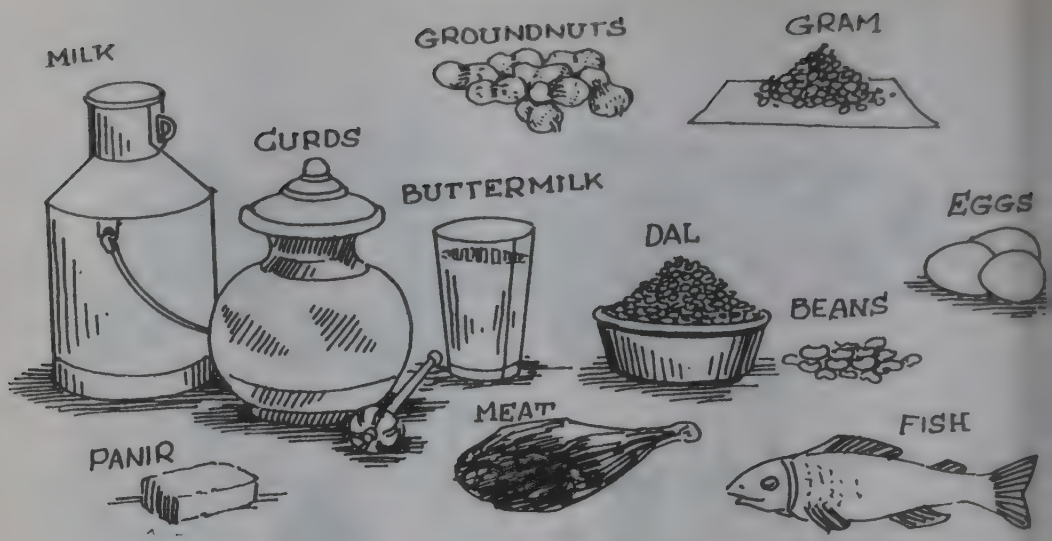

Fig. 2.7 : Food for growth and body building

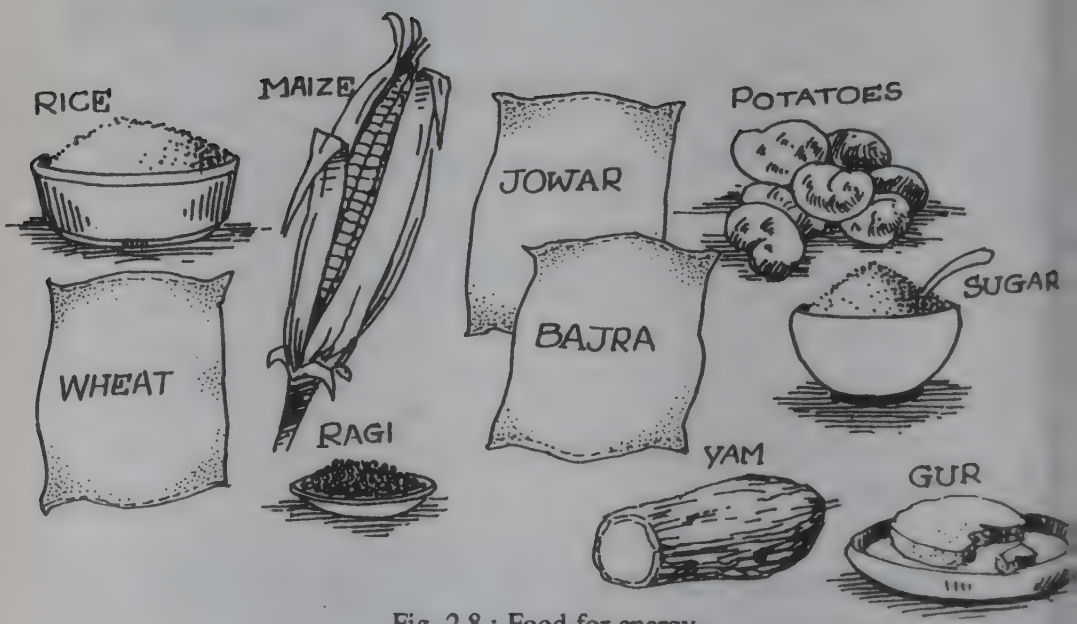

Fig. 2.8 : Food for energy

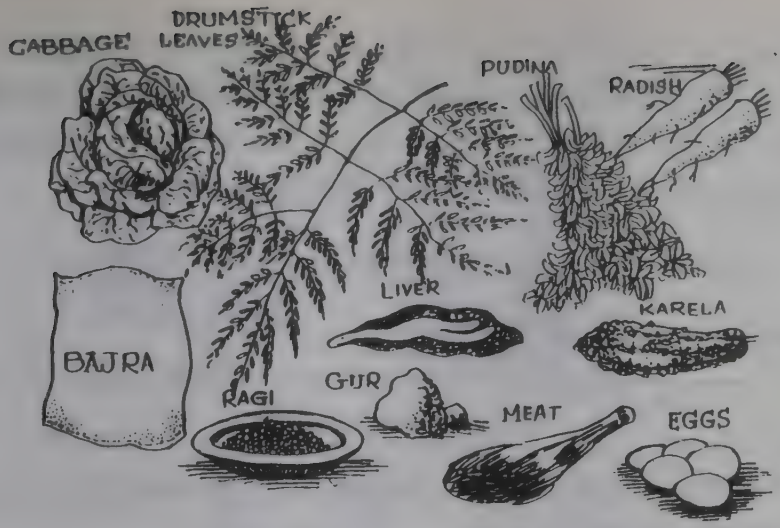

Fig. 2.9 : Food for protection

Observe the above figures and list out the names of food items in the table below:

Sl. No.	Food for body building	Sl. No.	Food for energy	Sl. No.	Food for protection

Fig 2.10 : A healthy child and an unhealthy child

See the pictures. The child in picture I is healthier than the child in picture II. Milk and food provide nutrients needed for the growth of the children. There are other ways of increasing the nutritive value of our diet. They are by using –

1. Sprouted seeds and fermented food items and,

2. Mixed pulses and cereals.

Points to remember	
1.	The food helps for our growth, it gives energy and protects against diseases.
2.	Sprouted seeds and fermented food have high nutrition value.

2.3 Digestion of food

Food is essential for the growth of our body. Our daily food contains cereals, dals, vegetables, oil and sugar. The food we eat does not go directly into the blood. These food items have to be

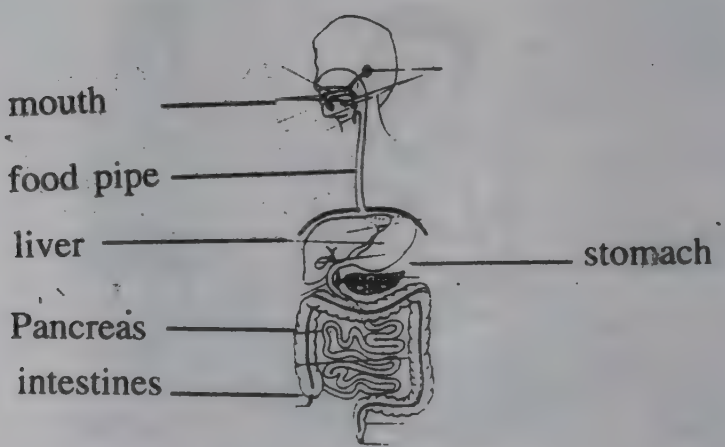

Fig. 2.11 : Digestive system in man

changed into new substances which can get into the blood. This process is called digestion. Many organs help in the process of digestion.

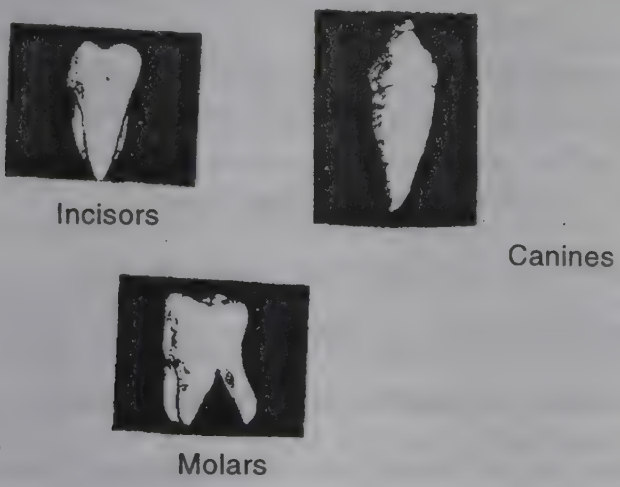

Fig 2.12 : Types of teech

Teeth help in digestion. In the figure you see three different types of teeth.

Incisors help us to bite food, canines help to tear and the molars help to grind the food. The teeth break the food into small pieces.

Activity 2.4 : List out the teeth mainly used to chew the following food items.

Biscuits, roti, sugarcane, apple, meat.

When we eat food, a juice called saliva is produced in the mouth. It helps in digestion.

Stomach and intestine also produce digestive juices. They help in converting insoluble food into soluble form.

The food is completely digested and absorbed in the intestine. The digested food enters into the blood. The undigested food is expelled out of the body.

Use of water : Water helps in digestion in many ways. They are :

1. To dissolve food
2. For the movement of food in digestive organs
3. For expelling the waste materials out of the body.

Points to remember	
1.	The teeth break the food into small pieces.
2.	Digestive juices help in digestion.
3.	Digested food is absorbed into the blood and the undigested food is expelled out of the body.

2.4 Food preservation

Activity 2.5 : Keep a slice of bread in two jars, one in a damp place and the other in a dry place. After a week, observe the bread slice. Write the changes in colour & smell of the bread slice

The activity of germs are more in damp and unclean places. The food stored in such places spoil quickly. They lose taste and nutrients.

The food stored in air tight containers are not spoiled quickly. This method is known as 'canning'. The food stored in this way can be preserved for a longer period. You can preserve foodstuffs, milk and vegetables if you can keep them cold. This can be done

using a refrigerator. Vegetables, fruits and foodstuffs kept in the refrigerator, can be preserved for a long time without spoiling.

Generally the milk, curry, cooked rice etc. get spoiled more quickly during summer than in winter because germs are less active at low temperature. So food stored in cool places do not get spoiled.

Fig. 2.13 : Refrigerator

Fish and meat are preserved by drying and salting.

Serving food carelessly results in spilling and wastage of food.

When vegetables, eggs and meat are cooked for a longer time, nutrients get destroyed. We must avoid overcooking the food and vegetables. While cooking, vessels should be covered.

Activity 2.6 : Take a sweet potato. Wash and clean in water. Slice it. Boil in water. Cool the boiled water and taste it.

When you boil vegetables in excess water, nutrients get into the water. So do not throw away this water. Use it as a soup or for making curry.

	Points to remember
1.	Food gets spoiled if it is stored in damp places and unclean containers.
2.	Canning preserve the food.
3.	Improper serving and spilling results in wastage of food.
4.	Over cooking destroys certain nutrients.

2.5 Food and Health

Food is important for us. It must be clean and free from germs. The food which contains germs is contaminated food. Eating such food causes vomiting, diarrhoea, dysentery, typhoid, cholera, jaundice etc.

Chemicals like DDT, sprayed to the plants to protect food grains and fruits from pests like insects, worms, rats etc. These chemicals are called pesticides. They are poisonous and harmful. Hence vegetables and fruits must be washed before use.

Always keep the food stuffs covered this should not be exposed.

The dirty flies carry the germs to the food kept open. They spread diseases, when we eat.

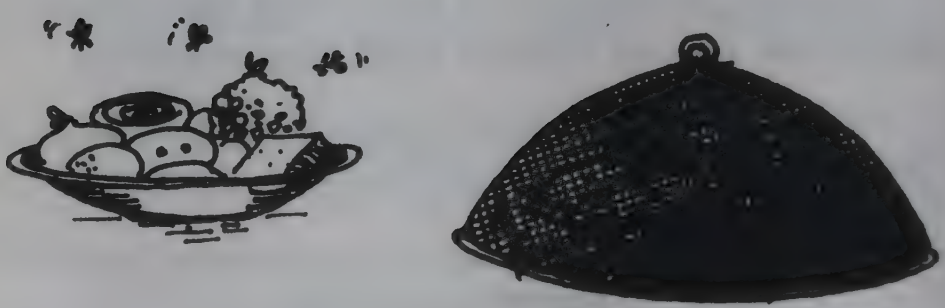

Fig. 2.14 : Showing food exposed and covered.

Do not eat cut fruits and foods exposed to dust and flies.

The spreading of diseases can be prevented by covering the food and keeping our surroundings clean.

Points to remember	
1.	Food is contaminated by flies.
2.	Eating food exposed to dust and flies cause diseases.
3.	Food should always be kept clean and covered.
4.	Food preserved at low temperatures remains fresh.

2.6 Water and health

Water for drinking purpose is usually obtained from rivers, tanks and wells. The mineral matter dissolved in natural water is not harmful to our health. Water which contains disease producing germs and suspended impurities is harmful. This may cause diseases like cholera, dysentery, jaundice and diarrhoea.

Such water should be filtered before use. This is done by filtration through large filter beds made from layers of sand and gravel.

Fig. 2.15 : Showing pollution of pond water

Pollution of water : Look at the figure. You find people washing clothes, taking bath and washing animals. In this way water becomes polluted.

The wastes from factories also pollute water.

Purification of water

Drinking water should always be free from floating impurities and disease producing germs. If there is floating matter in the water, it can be removed by filtering through a clean cloth.

If the water is turbid, the water can be filtered after making the impurities to settle down.

Germs present in the water can be killed by boiling the water.

Activity 2.7 : Take two tumblers A and B. Fill A with tube well water, B with pond water. Keep the tumblers in a corner of your class room. Do you find anything settling down the bottom of the tumbler? These substances are the impurities in the water. As they are heavy, they settle down at the bottom.

Pour out the top clear water from tumbler B into another glass tumbler. Put some alum into the water, keep it for sometime. Then observe it. The floating impurities settle down. Slowly tilt the tumbler and pour out the clear water to another container. This process is called 'decantation'.

Filtration : You can remove the impurities by filtration. Using domestic filters unfiltered water is made to pass through porous tubes made of unglazed porcelain. Floating impurities and bacteria can be get rid of by the filter.

The purified water should be stored in clean vessels. A clean vessel with a long handle should be used to take water from the stored vessels.

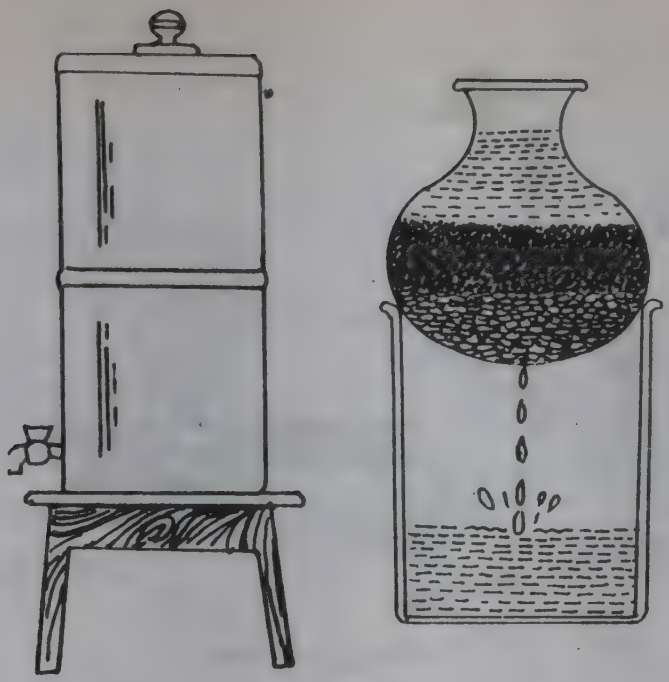

Fig. 2.16 : Filtration

In the pictures given below. Proper methods of taking out water are given :

Fig. 2.17 : Proper methods of taking out water

Fig. 2.18 : Wastage of water

Wastage of water : A lot of water is used everyday in our homes for cooking, washing, cleaning etc. You have seen the wells, ponds and tanks dry up in summer. Hence it is necessary that we must use water sparingly.

1. Do not use more water than is necessary.

2. Do not leave the taps running unnecessarily.

3. Do not wash clothes and bathe animals and pollute the sources of drinking water.

	Points to remember
1.	Drinking water should be free from floating matter and germs.
2.	Water should be protected from pollution.
3.	Water can be purified in many ways like filtration, decantation etc.
4.	Drinking water should be stored in clean vessels.
5.	Wastage of water should be avoided.

Fig. 2.19 : A house with clean surroundings

2.7 Health and hygiene

The water becomes dirty during washing, bathing and cleaning. When the used water is not drained properly, it is collected in pools. Mosquitoes breed in such water. They spread diseases.

Prevention of mosquitoes

Breeding of mosquitoes can be prevented when we

1. Do not allow dirty water to stagnate.
2. Cover the water tanks and open wells.
3. Keep drains clean.
4. Spray a thin film of kerosene over stagnant water.

Flies breed in garbage and spread diseases. They can be prevented by keeping our surroundings clean.

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We can keep our surroundings clean when we

1. Use dustbins to collect wastes.
2. Bury waste materials.
3. Grow plants.
4. Do not spit on the roads or in the playground.

	Points to remember
1.	Our surroundings should be kept clean.
2.	Unclean surroundings cause diseases.
3.	There should be clean drinking water and toilet facilities in houses and schools

EXERCISES

I. Put a (✔) mark on the correct statement and (X) mark on the wrong statement.

1. Over cooking of food should be avoided.
2. Well water is good for drinking.
3. Food stored in cold storage spoils quickly.
4. Stomach is an internal organ.
5. Cleanliness prevents many diseases.
6. Fermented food has low nutritive value.

II. Four answers are given for each statement. Underline the correct answer.

1. The organ that pumps blood is

   a. Intestine c. Heart
   b. Liver d. Lungs

2. Food is essential for

   a. Excretion c. Evaporation
   b. Sleeping d. Body building

3. The best way of purifying water is

   a. Evaporation c. Decantation
   b. Boiling d. Filtration

4. The teeth that help in biting of food are

   a. Premolars c. Incisors
   b. Molars d. Canines

5. Vegetables are preserved in

   a. Refrigerators c. Salt
   b. Gunny bags d. Water

III. Fill in the blanks

1. _____ is used to purify water

2. The nose, the wind pipe and lungs form _____ system

3. The method of storing food in air tight containers is called _____

4. _____ is an organ of taste

5. The _____ expands while breathing in

IV. Match the following

A	B
1. Milk	a. Wastage of food
2. Lungs	b. Malaria
3. Over cooking	c. Complete food
4. Improper serving	d. Clean vessels
5. Mosquitoes	e. Destroy nutrients
6. Drinking water	f. Respiration

V. Answer the following

1. Name the three types of teeth.
2. Name any two organ systems in our body.
3. How can we increase the nutritive value of food?
4. Mention the ways in which water gets polluted.
5. List the different ways of purifying water.
6. What is 'canning' ?

VI. Things to do

1. Visit a doctor and learn about the diseases caused by deficiency of vitamins.
2. Visit your friend's houses and find out their daily diet.
3. Make an album by collecting all the figures of internal organs of man.
4. Visit a water purifying plant and find out the different ways of purifying water.

3. MATERIALS AND THEIR PROPERTIES

3.1 We see a large number of things around us. How are these things different from one another? We can see them either as solids, liquids or gases. Substances also have certain properties like colour, smell, taste etc. We recognise them by their characteristic properties.

Some substances are hard and some are soft.

Activity 3.1 : Take a pencil and an eraser from your instrument box and examine.

Some substances are breakable.

Activity 3.2 : Drop a piece of chalk from a height. What happens to the piece of chalk? Try to do the same with a piece of wood. What do you observe?

Some substances are soluble in water.

Activity 3.3 : Take some water in a glass tumbler, add a spoon of common salt. Stir it well. The salt dissolves in water. Now repeat this experiment with sugar, chalk powder and sand. What do you observe? Sugar readily dissolves in water. Chalk powder and sand do not dissolve in water.

In other words we say that sugar and salt are soluble in water. Chalk powder and sand are insoluble in water. Petrol dissolves wax. Turpentine dissolves oils.

Some substances allow light to pass through them.

Activity 3.4 : Take a sheet of cardboard, a piece of glass, a wooden plank and a polythene. Hold each of these and look

through them. Now direct a torch light on each of them. Which of these materials allow the light to pass through?

Materials like glass and polythene allow light to pass through them. They are called transparent bodies. Cardboard and wooden plank do not allow light to pass through them. They are called opaque bodies.

Some substances are good conductors of heat.

Activity 3.5 : Place your instrument box and the wooden scale in the sun for some time. Touch both of them and find out which one is hotter?

Instrument box is hotter than the wooden scale.

Some materials like iron, aluminium etc. become hot when exposed to heat. These materials allow heat to pass through them. They are called good conductors of heat. Materials like wood, leather etc. do not allow heat to pass through them. They are called bad conductors of heat.

Since wood and plastic are bad conductors of heat, they are used as handles of iron box and cookers.

Things to do

1. Classify the following materials into hard or soft : sponge, wood, cotton, iron rod, clay, silk, wool.

2. Classify the following materials into breakable and not easily breakable : copper, ice candy, sugar marble, pencil lead, stone, steel tumbler.

3: Make a list of materials which are soluble and insoluble in water.

3.2 Nature of Materials

All materials are made up of small particles.

Activity 3.6 : Take a piece of chalk and a marble. Crush them into a fine powder. Look at the powder through a hand lens.

What do you observe ?

Are the liquids also made of tiny particles?

Activity 3.7 : Take some water in a dish. Keep it in the sun. Observe it after a day or two. The level of water in the dish becomes less. Water evaporates due to heat of the sun. When it evaporates, water changes into water vapour. Water vapour is made of very small particles. You cannot see them. Like water, all other liquids are also made of small particles.

3.3 Solution

Activity 3.8 : Take some water in a glass tumbler. Add a few crystals of potassium permanganate into it. Observe carefully.

The crystals of potassium permanganate break up into smaller particles and dissolve. The colour of the water becomes pink. This shows that the particles of potassium permanganate get distributed into water uniformly to form the solution of potassium permanganate. Water dissolves a large number of substances : Hence it is called a universal solvent. A substance dissolves in water to form a solution.

Things to do

1. Repeat the above experiment by dissolving crystals of common salt.

3.4 Methods of separation

Activity 3.9 : Take some water in a beaker. Add some sand and keep it for some time without disturbing it. The sand settles at the bottom. The process of allowing insoluble substance to settle down is called sedimentation.

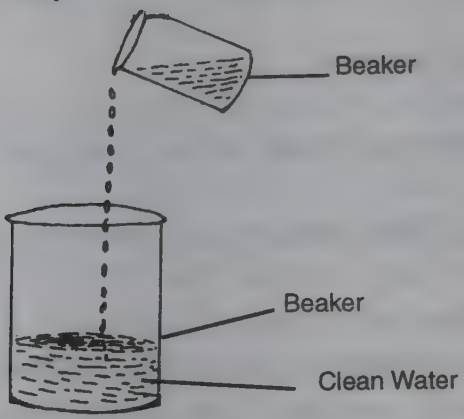

Fig. 3.1 : Decantation

Now pour the clear water from the top into another beaker without disturbing the sediment. This process is called decantation.

Filtration

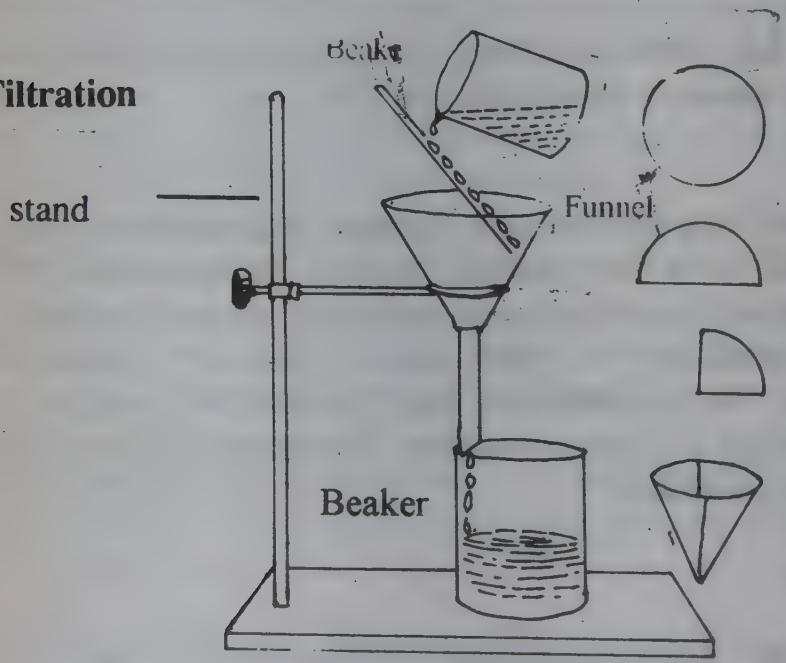

Fig. 3.2 Filtration

Activity 3.10 : Take a round filter paper fold it twice. Then open it out in the form of a cone as shown in the figure. Put it in a funnel. Place the funnel on the funnel stand. Keep a clean beaker under the funnel. The tip of the funnel should touch the inner side of the beaker.

Pour the clear decanted solution into the funnel carefully. The clear water passes through the filter paper and collects in the beaker. This is called filtrate. The insoluble sand particles if any remains on the filter paper.

Evaporation

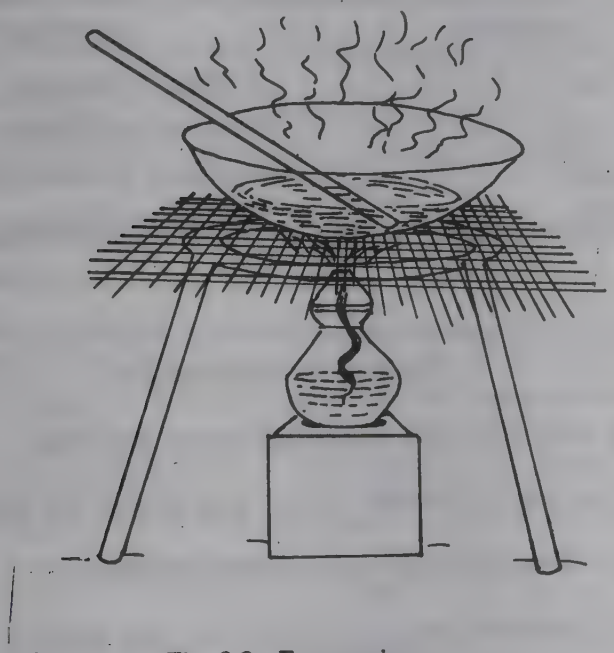

Fig. 3.3 : Evaporation

Take some water in a China dish. Add salt to it. Dissolve by stirring, boil the solution well. Cool the contents. What is left behind after all the water evaporates ?

When all the water evaporates, some substance is left behind.

What is this substance? Examine.

Sea water contains a large quantity of salt. To get the common salt from sea water, it is allowed in shallow trenches, the water evaporates slowly. When all the water gets evaporated, crystals of common salt are left behind.

Activity 3.11 : Observe the crystals of common salt, copper sulphate and alum through a lens. Crystals of different materials have different shapes.

Some common substances that you see have chemical names : Read the table

Substance	Chemical name
Common salt	Sodium chloride
Washing soda	Sodium carbonate
Baking soda	Sodium bicarbonate
Blue vitriol	Copper sulphate

	Points to remember
1.	Some materials are hard and some are soft.
2.	Some materials break easily and others do not.
3.	Some allow light to pass through them.
4.	Some materials transmit heat through them.
5.	All substances are made of tiny particles.
6.	When a solid dissolves in water, it breaks.
7.	The process of separation of liquid from the sediment is decantation.
8.	The insoluble substances can be separated from a liquid by filtration

EXERCISES

1. Given below are some statements. Put a tick (✔) mark against the true statement and a cross (X) mark against the false statement.

   (a) Milk is a liquid.
   (b) Wood is a good conductor of heat.
   (c) Salt dissolves in water.
   (d) Glass breaks easily.
   (e) Polythene is an opaque material.

2 Four answers are given for each Statement
Under line the correct Answer

(i) Common salt is obtained from sea water by :

(a) Sedimentation (b) Evaporation
(c) Filtration (d) Decantation

(ii) Water dissolves

(a) Wooden piece (b) Sand
(c) Common salt (d) Iodine

(iii) An example for transparent materials

(a) Wooden plank (b) Cardboard
(c) Iron sheet (d) Glass sheet

(iv) Kerosene is a

(a) Liquid (b) Solid
(c) Gas (d) None of these

(v) Wax dissolves in

(a) Water (b) Mustard oil
(c) Kerosene (d) None of these

3. Fill in the blanks with suitable words.

(a) Matter exists in solid, liquid or _____ states.

(b) Insoluble solids can be separated from liquids by_____

(c) Rubber is a _____ conductor of heat

(d) Water is a _____ solvent

(e) The chemical name of common salt is _____

4. A) Match the following

A	B
1) Stone	a) is colourless
2) Sugar	b) helps in burning
3) Water	c) is insoluble in water
4) Kerosene	d) is a gas
	e) dissolves in water

B)

1) ice	a) bends easily
2. rubber	b) conducts heat
3) glass	c) dissolves in water
4) metal	d) a solid form of water
	e) break easily

5 Give an example for

(a) a soluble substance and an insoluble substance in water.

(b) a Soild and a liquid.

(c) a good conductor of heat and a bad conductor of heat

(d) a transparent body and an opaque body.

4. AIR, WATER AND WEATHER

We talk of the weather as hot, cold, cloudy or fair. What makes the weather? How do these changes take place?

The air, water and the sun are the parts of the weather. You will always see them in every kind of weather. Without them, you would have no weather.

You know how important the weather is to you. If it is hot, we wear light clothes. If it is cold, we wear warm clothes. You will not only want to know about the sun but also about the wind, clouds and the rain. Changes in weather depends upon how much of the land and water are heated up by the sun.

The sun gives us light as well as heat. Without the heat of the sun, the earth would be so cold that we could not live. The surface of the earth is covered by air. We live in the ocean of air just as a fish lives in the ocean. We call this ocean of air as atmosphere. The land is heated up by the sun and hence the atmosphere. Water is also heated by the sun.

Just as air, water is also important to us. The earth has a large store of water. You have seen that during rain, water is collected in the ponds, tanks and wells. During summer they are almost dried. How does this happen?

Activity 4.1

a) Put some sand in a saucer and some water in another. Place both of them in the sun for about half an hour. Find out which is warmer?

b) Take out the saucers out of the sun. Feel the sand and water after sometime. Find out which is cooler?

Fig. 4.1

Due to the heat of the sun, the land gets heated up much faster than water. During nights, the land cools down faster than water.

Evaporation

When we say that the pond is dried up, we mean the water in it has disappeared. What happened to the water?

Water is heated up by the sun and changes into vapour. The tiny particles of water jump into the air and rise up by the air. Then we say that the pond water has evaporated.

What causes evaporation? It is the heat which causes water to evaporate. All day long, water from ponds, tanks and wells is heated up by the sun and evaporates.

You have seen the ponds, tanks and wells dry up during the summer. Your mother washes the clothes and hangs them up to dry. As the water in the wet clothes evaporate, they become dry.

By the following activities, you will find out when evaporation works best.

Activity 4.2

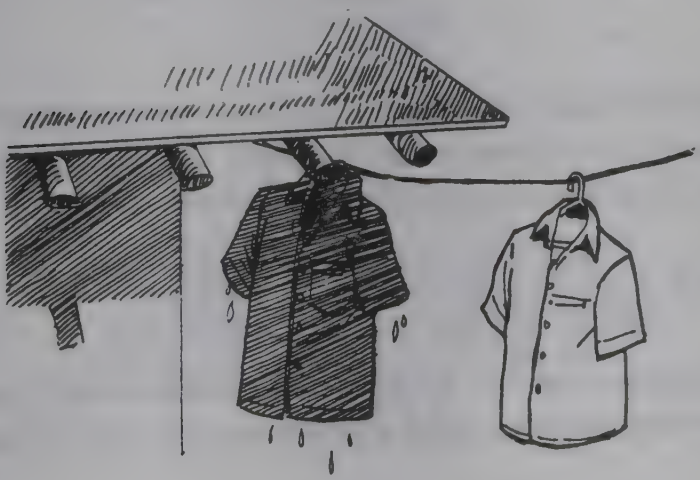

Fig. 4.2

In the fig. 4.2, you will see two shirts hung up to dry. One of them is the sun and the other is the shade. Which of them dries first? and Why?

When there is sunshine, the evaporation is faster. Water from the seas, tanks and ponds evaporate faster during the daytime.

Activity 4.3

a) In the figure, you will see two wet pants hung up to dry. One is spread and the other is folded twice. Which dries fast?

b) When you are given hot milk in a cup to drink, you pour it in the saucer. Why?

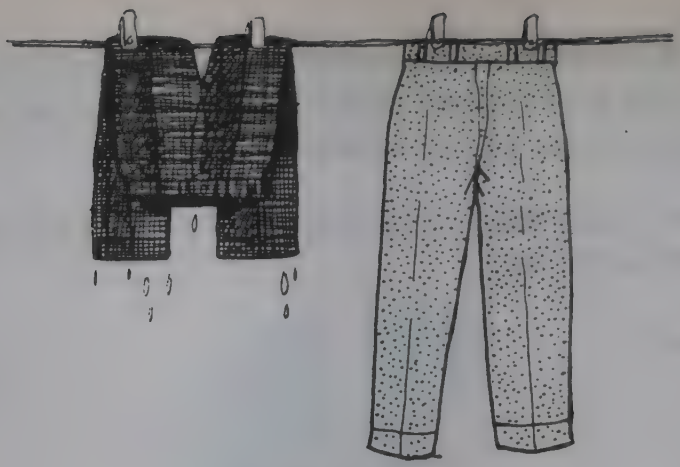

Fig. 4.3

Ponds and tanks dry faster than well because they have a large surface area exposed to the sunlight. Sea water is spread to millions of kilometres so that evaporation may be faster.

Activity 4.4

In the figure, you will see two handkerchiefs hung up to dry. On in the wind and the other where the air is still. Which dries fast?

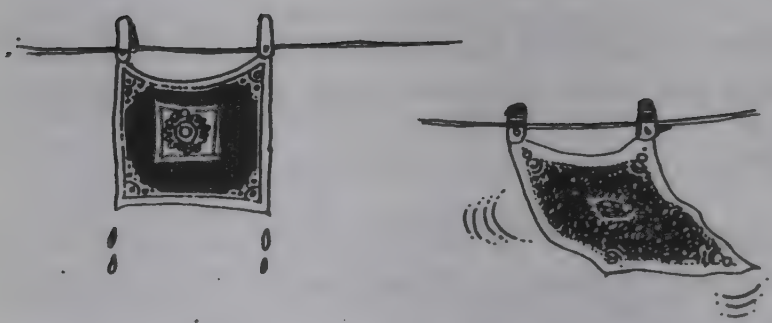

Fig. 4.4

When the wind blows over the sea, tanks and ponds, evaporation is faster.

Condensation

You have learnt that water from the ponds, tanks and seas evaporate. But if water keeps on evaporating all the time, why doesn't everything dry up?

Activity 4.5

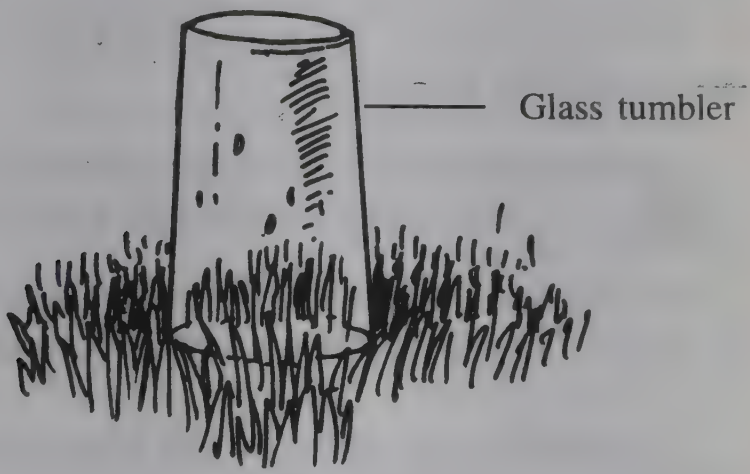

Fig. 4.5

Take a clean and dry glass tumbler and place it upside down on the grass when the sun is shining brightly. Observe what happens after sometime.

A watery film begins to form on the inner surface of the glass. Water from the grass and the soil evaporates and these tiny vapour when cooled becomes water drops. This process is called condensation. During condensation water vapour changes back into water.

Now you understand how water rises up in air as water vapour. Condensation happens in the atmosphere when vapour begins to form tiny drops which we can see as clouds or fog. If these tiny drops in the clouds become large enough to be contained by air,

they fall back to the ground as rain. When the upper layers of the air are cold, little pieces of ice may be formed instead of water drops and fall to the ground as hailstones.

Activity 4.6

In the early morning, watch tiny drops on the grass. How do these drops form?

Activity 4.7

On a cold morning you form a little cloud everytime your moist breath hits the cold air.

The water vapour when comes in contact with the cooled soil, condens as tiny drops on the blades of grass. These drops are called 'dew' drops.

On very cold nights, the water vapour condenses directly into ice crystals. The crystals form a white film on the ground. This film is frost.

The weather is very cold on the hills during winter. The clouds change into snow instead of rain.

Seasons

Depending upon the weather, a year is divided into four seasons. They are spring, summer, autumn and winter.

You have already learnt that the summer is the hottest season of the year. Rainy weather occurs in the spring when plants and crops begin to grow. During autumn, the leaves fall from trees. Winter is the coldest season of the year.

Changes in weather bring change in the life of plants, animals and ourselves. You know that in hot weather, we make ourselves cool using cool drinks, fans and light clothes. In cold weather, we make ourselves warm using warm food and clothes.

Birds and animals migrate to warm places during winter. During rains, hailstones damage crops and our property.

Points to remember	
1.	The land is heated faster than water and also cools faster than water.
2.	The change of water into water vapour is evaporation.
3.	Evaporation is faster when water is exposed to the sun.
4.	Evaporation is faster when water has a large surface.
5.	Evaporation is faster when the air over the surface is blown off.
6.	When water vapour are cooled, they are said to be condensed.
7.	Evaporation, condensation and rain form a water cycle.
8.	Spring, summer, autumn and winter are the four seasons.
9.	Birds and animals migrate during cold seasons.
10.	Hailstones damage crops and property.

EXERCISES

Given below are some statements. Put a tick (✔) mark against the true statement. Put a (X) mark against false statement.

I. (1) Heavy rains damage life and property
(2) The sun is not the main source for changes in weather.
(3) Condensation is the opposite of evaporation
(4) In summer the days are longer than nights.

II. Under line the correct answer.

(i) The process in which water slowly turns into water vapour is called

(a) Condensation (b) Evaporation
(c) Sedimentation (d) Decantation

(ii) Evaporation takes place

(a) only during day
(b) only during night
(c) at all times
(d) when the wind blows

(iii) The water vapour condenses on grass and leaves in the form of shining droplets. They are called.

(a) dew
(b) snow
(c) frost
(d) clouds

(iv) Rain is due to
(a) evaporation
(b) condensation
(c) condensation and evaporation
(d) none of the above

3. Fill in the blanks

1) During evaporation, water changes to _____

2) The four seasons in a year are _____, _____, _____ and _____

3) Water evaporates faster when air is_____

4) We prefer cotton clothes in _____

5) _____ is the coldest season of the year.

4. a) Collect information about weather with the help of T.V. and Radio. and newspaper

b) Collect pictures of "damages caused by heavy rains"

c) Collect pictures of animals living in various parts. Study their differences.

5. SOIL AND CROPS

Look around your school playground. You will find soil everywhere. It is important for our survival. It is our natural resource. We cannot grow plants or build houses without it.

5.1 Formation of soil

Soil comes from rocks. Rocks contain a number of minerals. How do you get soil from rocks ?

Activity 5.1 : Take two pieces of rocks (slate and limestone) and rub one against the other. Collect what falls from them. Observe the rubbed surface. Examine the powder with the help of a hand lens.

Record your observations and inference.

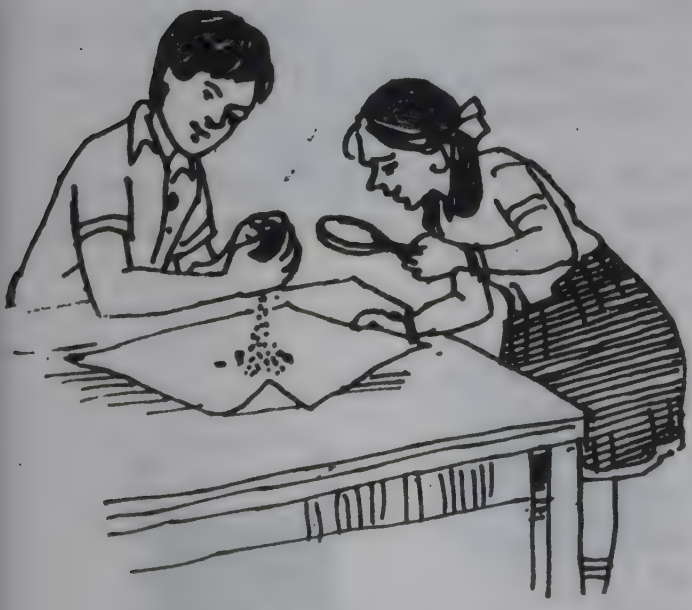

Fig. 5.1 Rubbing of rocks

You may find that the rocks break into particles of different sizes and colours.

In nature, soil particles of different sizes and colours form when rocks break.

The rocks break into small particles due to the continuous action of sunlight, rain, frost, acids and wind. These smaller particles of rock become soil.

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Points to remember	
1.	Soil is important for our survival
2.	Soil comes from rocks.

2. Kinds of soil

Activity 5.2 : Collect samples of soil from your school ground, roadside, garden and home ground in different plates. Observe the colour. Touch and see the size of the particles in each of them. Record your observations in the table.

Sl. No.	Soil	Colour	Size
1.	School ground		
2.	Road side		
3.	Garden		
4.	Home ground		

You may see soils of different colours and sizes. They may be rough, smooth or soft to touch.

Activity 5.3 : Put the soil collected from different places in a glass beaker. Mix them well. Pour water into the beaker. Stir the mixture. Allow it to settle.
Observe the way the soil settles.

It settles in layers. At the bottom are the larger particles of sand. In the middle are smaller particles. It is clay. On the top are floating particles. It is humus. Humus makes the soil fertile. A mixture of sand, clay and humus is called loam.

Fig. 5.2

There are three kinds of soil around us.

a. Sandy soil : If the sand particles are more and soil is white brownish in colour.

b. Clayey soil : If the clay particles are more and soil is black in colour.

c. Loamy soil : If the loam particles are more and soil is yellowish brown.

You know that when it rains, rain water falls on the soil. Some soils allow water to pass through quickly and others do not.

Which soil allows most water to pass through ?

Which soil holds the water most ?

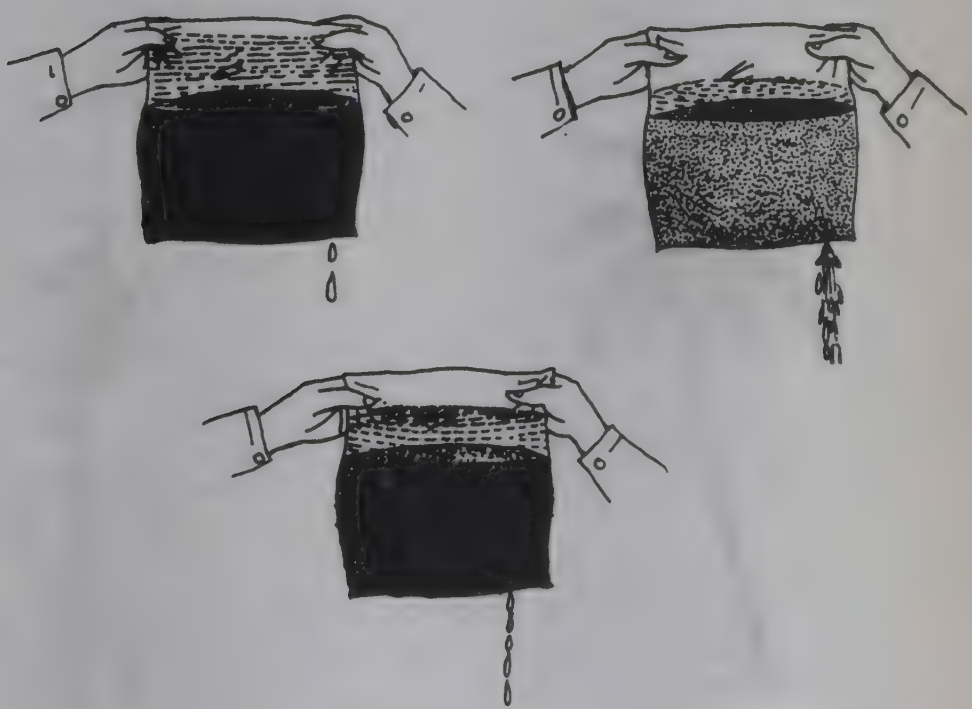

Fig. 5.3

Activity 5.4 : Take three plastic bags of equal size. Make a small hole at the bottom of each bag. Fill one with sandy soil, the other with clayey soil and the third with loamy soil. Ask your friends to hold a bag each. Keep a beaker below each of the holes. Now pour equal quantity of water into each bag. Observe and record below.

Sl. No.		Bag 1	Bag 2	Bag 3
1.	Time taken by water to come down			
2.	Quantity of water collected in the beaker			

Sandy soil allows most of the water to pass through, Clayey soil holds most of the water. Loamy soil holds enough water and allows the remaining water to pass through.

Cocoanut Tree

Paddy

Fig. 5.4 Different kinds of crops.

Points to remember	
1.	Sand, clay and loam are the three kinds of soil.
2.	Humus makes soil fertile because it contains organic matter.
3.	Sand allows most water to pass through it.
4.	Clay holds most water in it.

3. Kinds of soil and crop

You know that crops like wheat, paddy and coconut are grown in different kinds of soil. Wheat grows best in loamy soil. Paddy grows best in clayey soil. Coconut grows best in sandy soil.

Activity 5.5 : Visit different farms and fields in your locality. Enquire about the types of crops grown there. Complete the following table (take the help of your teacher and parents).

Sl. No.	Crop	Types of soil	Sl.No.	Crop	Types of soil
1.	Groundnut		6.	Mustard	
2.	Maize		7.	Sunflower	
3.	Beans		8.	Ragi	
4.	Cotton		9.	Jowar	
5.	Tomato		10.	Sugarcane	

Points to remember	
1.	Different crops need different kinds of soil.

5.4. Soil fertility

A. **Humus :** In an earlier activity, you have learnt that the suspended particles of soil in a beaker of water is Humus. Have you seen a manure pit? It has humus and it is rich in organic matter.

What is humus ? The dead parts of the plants, worms, insects, and animal matter decay and become one with the soil. It is called Humus.

Activity 5.6 : Collect samples of soil from the bank of a river or a canal. Also collect soil from a field, a dry pond and a garden. Put equal amounts of these samples in separate glass beakers. Add equal amounts of water to the beakers and stir. Allow the mixture to settle. Observe and fill in the blanks below.

Most humus is found in the soil collected from _____
Least humus is found in the soil collected from _____

You may find humus contents most in loamy soil.

Fig. 5.5

Farmers cannot grow crops everywhere. To grow the crops some soils should have sufficient humus.

How does humus in soil help crops to grow?

Activity 5.7 : Take three pots. Fill one with sandy soil, the other with clayey soil and the third with a mixture of soil from

manure pit, sand and clay. Put a bean seed in each of the pots. Keep the pots in sun and water them everyday. Observe the growth of bean plants over a few weeks. Record the height of the plants in the table below.

Sl. No.	Pot	Growth (in weeks)			
		1.	2.	3.	4.
1.	Sandy soil				
2.	Clayey soil				
3.	Soil with manure				

The bean plant in the pot having manure grow well. The humus in manure makes the soil fertile and the plant grows well. The soil in other pots are less fertile.

B. **Fertilizers :** Crops grow well in a fertile soil. Farmers make soil more fertile by adding natural manures and chemical fertilizers to grow crops.

Natural manures are compost, Neem cake, Honge cake, Fish meal, blood meal and crops such as subabul and sesbania.

Chemical fertilizers are those available in market - urea, phosphates (DAP), potash, suphala.

Do you know the effect of chemical fertilizers on growth of plants?

Activity 5.8 : Take some soil from a field. Put the soil in two pots. Take a spoon of fertilizer, dissolve it in water. Then pour it on the soil in one pot. Put a seedling in both pots. Water them. Observe the growth of plants.

You will find that plants grow well in the soil mixed with chemical fertilizer.

Points to remember	
1.	Humus is present in loamy soil
2.	Manures and Fertilizers make the soil fertile.

5.5 Crop yield

Activity 5.9 : Visit the agriculture office in your locality collect information about (a) different stages of growth of crops (b) ways of using manures and fertilizers (c) methods of irrigation (d) seasonal crops (e) ways of getting better yield of crops and storage.

A model farmer gets higher yield of crops in his area of land by following modern agricultural methods. They are by using

1. Iron plough for tilling.
2. Hybrid seeds for sowing.
3. Fertilizers in proper proportion.
4. Improved irrigation methods.
5. Pesticides at appropriate time.
6. Improved grain storage and
7. Growing different types of crops in the same plot of land at different seasons.

A. Crop rotations

You have seen that farmers do not grow the same crop season after season or year after year in the same plot of land. They change the crops. They grow paddy, raddish, sunflower, cotton, soyabean or green gram in rotation. This is called crop rotation.

The roots of greengram plant have root nodules and the bacteria that gives nitrates to soil for better yield of paddy. It improves soil fertility. It gives better yield without extra cost.

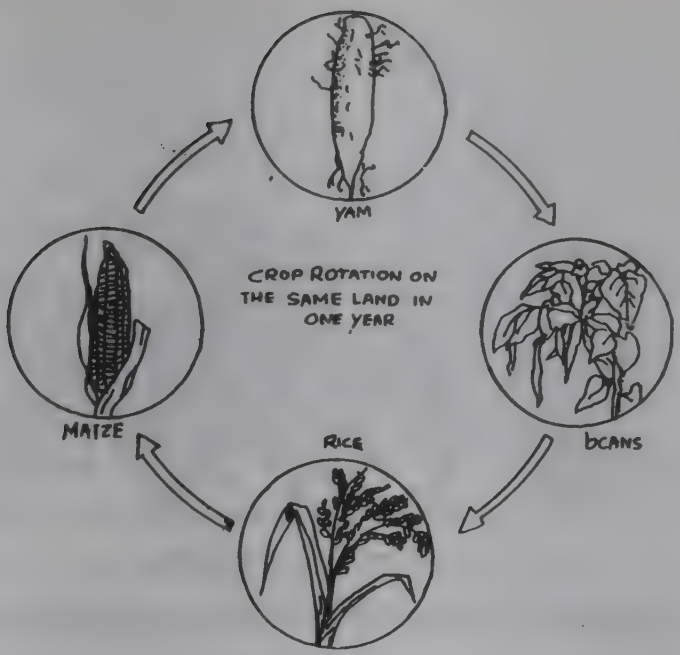

Fig. 5.6 Rotation of Crops

B. Irrigation

Crops need water for their growth. The water supply at proper times of growth is called irrigation. Good irrigation helps to get better yield of crops.

Farmers depend on rain, river, tank or pond water for irrigation. When there is no rain, they use sprinklers to water the crops.

Do you know that the supply of water increases the plant growth.

Activity 5.10 : Take two pots. Put some soil taken from the garden. Sow ragi seeds in both the pots. Water one pot regularly and leave the other pot as it is. You will find that watered ragi grows faster.

Fig. 5.7 Sprinklers to water the Crops

Different kinds of plants require different quantities of water for their growth.

C. Quality of seed

Quality of seed is important for better yield. Nowadays hybrid seeds and quality seeds are available in the market.

Activity 5.11 : Visit a farm store in your locality and examine the different seeds. Observe how seeds are preserved and stored.

D. Control of pests

You know it is important to protect crops and food grains. There are a large number of enemies to crops and food grains. They reduce the crop yield and spoil the stored grains. They are called pests.

The common pests are rats, squirrels, birds, monkeys, insects, mites and worms.

Fig. 5.8 : Spraying of pesticides

A farmer uses various chemicals called pesticides to protect the crops and grains from pests. They may be powder, liquid or gas. The pesticides are sprayed using sprayers.

Have you seen pesticides being sprayed in a garden to protect the plants?

E. Storage

Polythene bags are good for storing food grains. The bags are kept in storage bins made of cement. They are kept dry. Pesticides are used inside the bins to keep pests away.

Activity 5.12

1. Visit the nearest warehouse. Observe the methods of preserving food grains.

2. Learn from your parents the ways of protecting food grains from pests at home.

Points to remember	
1.	Rotation of crops gives better yield and improve soil.
2.	Quality seeds, good irrigation and pest control, help in better crop yield.
3.	Polythene bags and cement bins help better storage of food grains.

EXERCISES

I. Say whether the following are true or false. If true put (✔) and if false put (X) for each.

1. Frozen water breaks the rock.
2. Sand is yellowish brown in colour.
3. Paddy is grown best in clayey soil.
4. Loamy soil allows enough water to pass through it.
5. Food grains are stored in gunny bags in warehouses.

II. Complete the following by using a suitable word given in the brackets.

1. Clay is _____ to touch (rough, smooth, soft).
2. Sand settles at the _____ in a beaker of water (top, bottom, middle).
3. A mixture of sand, clay and humus is _____ (manure, fertilizer, loam).
4. Humus in soil makes it _____ (dirty, fertile, infertile).
5. In the farm yard we get _____ manure (compost, neem cake, urea).

III. Fill in the blanks

1. Wind and water _____ soil from one place to another.
2. Farmers prefer _____ soil for cultivation.
3. _____ grows best in sandy soil.
4. The dead and decayed parts of living things in soil form _____.
5. _____ is a chemical fertilizer used in farming.

IV. Match the following :

A	B
1. Garden	a. Humus
2. Seashore	b. Loamy soil
3. Pot	c. Sandy soil
4. Suphala	d. Clayey soil
5. Subabul	f. Manure

V. Answer the following :

1. How is soil formed ? Give an example.
2. How many kinds of soil are there? Name them.
3. Mention the methods of making soil more fertile.
4. What is rotation of crops? Mention one use.
5. What are pests?
6. How can we protect crops and grains?

VI. Things to do :

1. Listen to farmers programme on Radio and watch TV.
2. Collect different colours of rock, classify them with respect to size, colour and hardness.
3. Visit a farm. Know from the farmer about crops grown in various seasons.

6. FORCE, WORK AND ENERGY

Observe the pictures given below.

Fig. 6.1

1. A boy is drawing a toy.
2. A man is lifting a stone.
3. A man is drawing a cart.
4. A man is pushing a cart.

In each of the above examples, pushing drawing and lifting refers to the action of the force. Hence force is an external action which makes the objects change its place.

When we move things by lifting, pulling or pushing them, we say that we do work. Work is done while walking, running, playing or swimming.

Work is said to be done when the force acting on a body changes its position. Whenever a football is kicked, you are applying a force on it. The football moves through a certain distance, we say that work is done.

Activity 6.1 : Push a chair so that it moves through a certain distance. You have done work. The push that you gave to the chair is the force that you have applied.

When you push it with a greater force, it moves through a greater distance. You have done more work.

If greater force is applied with larger displacement, the work done is more.

Some times when a force is applied, the body does not change its position. You push a wall, it does not move. In such a case, no work is done by the force.

If you lift a stone, you have done work. To lift a bigger stone, you have to do more work. That means you must have more energy. Energy is the capacity to do work. When you do work, your energy is spent.

There are many forms of energy. You are familiar with heat, electricity, light and sound.

Things from which we get energy are called **sources of energy**.

There are many sources of energy. The food that you eat gives energy to do mechanical work. Food is a source of energy.

We dry our clothes in the sun. We use sun's energy to cook our food or heat the water. Plants also use sun's energy to prepare food.

Sun is a source of energy

We cook our food, iron our clothes using electricity. Electrical energy is used to give light, to run the fans.

Electricity is a source of energy.

Activity 6.3

List out various appliances where we use electricity.

Firewood, coal, petrol, diesel are different types of fuel. To run a car or a bus we need fuel. We need fuel to cook our food such as gas, firewood.

Fuel is a source of energy

	Points to remember
1.	The objects move when we apply a force.
2.	Work is done when a force applied on a body to produce a displacement.
3.	The direction in which the body is displaced is always in the direction of the force.
4.	Energy is the capacity to do work.
5.	Sun, food, fuel, heat, electricity are the sources of energy.

EXERCISES

I. Is work done in the following activities

1. When a toy is pulled with a string tied to it.
2. Standing and waiting for a bus at a bus stand.
3. A boy is running.
4. A book placed on a table.
5. A bus is moving

II. Mention the source of energy used in the following.

1. Motor car
2. Country boat
3. Bullock cart
4. Cycle
5. Electric fan

III. Answer the following questions

1. What is force?
2. What is energy? Mention its source?
3. Why do we eat food?
4. Which fuel is used in a railway engine?
5. Give example of substances used as fuel.

IV. Activities

1. Visit a factory or a mill and observe the machines working there. Find out the sources of energy for them.

2. Throw a cricket ball as far as you can and measure the distance. Tell your friends to do the same and compare.

3. Make a kite and make it fly. Which is the source of energy for the kite to fly ?

7. EARTH AND SKY

1. Solar system

The diagram shows the sun and its family of planets. There are nine planets.

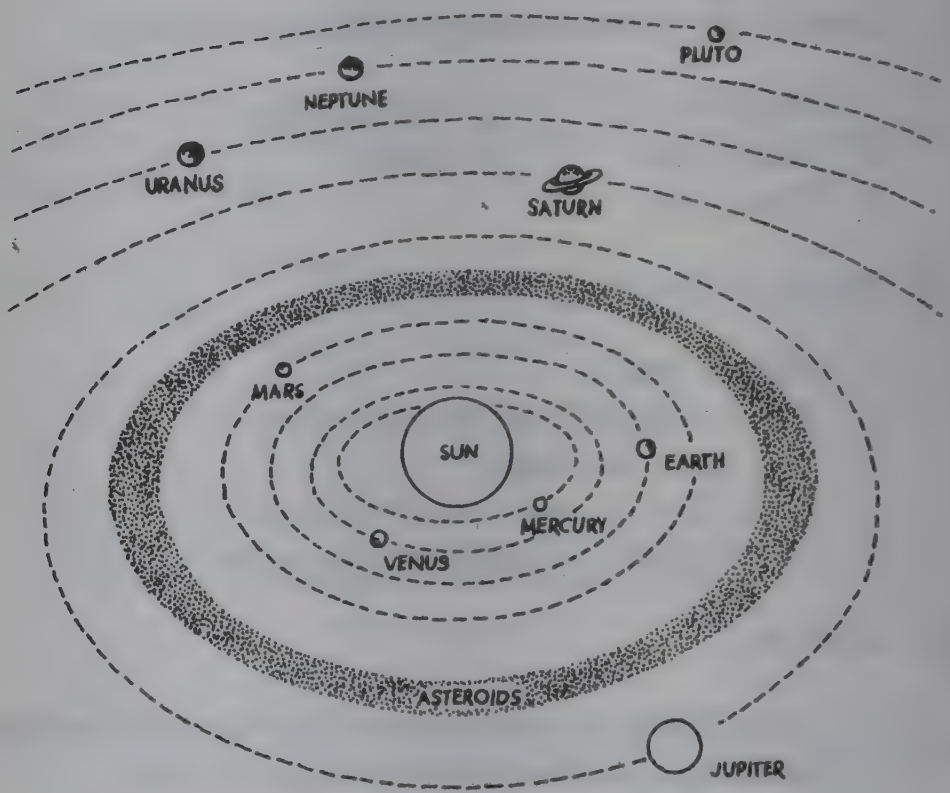

Fig. 7.1 Planets

Observe the diagram above and list the names of the planets. Which is the biggest planet? Which planet is nearest to the sun? Which is the farthest from the sun?

The planets turn round on their axis and also move round the sun. The planets do not have light of their own. They only reflect the light of the sun.

The earth is one of the planets. We live on it. It has an atmosphere. The earth moves round the sun. It takes one year to move round the sun once.

You have seen the moon shining in the sky. The moon is not a planet. It moves round the earth. An object which moves round a planet is called a satellite. The moon is a natural satellite of the earth. Like earth some planets also have their satellites.

2. Day and Night

Activity 7.1 : Close the doors and windows of your class room. Make it dark. Take a candle and light it. Put it on the table. Keep a football or a globe in front of the light. Observe how much portion of the ball or the globe receive the light.

In the same way the earth gets light from the sun. The sun's rays fall on the earth. It is day time where it is lighted. At the same time other half of the earth is not lighted. It is night there.

Activity 7.2 : In the above experiment rotate the ball or the globe slowly. What do you see ? The surface that gets light slowly changes.

The earth spins about its axis. This causes day and night. The earth takes 24 hours for making one revolution. The earth moves from west to east, but it appears to us that the sun is moving east to west.

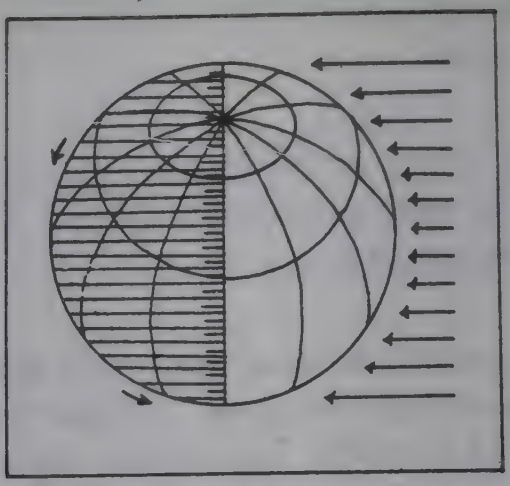

Fig. 7.2

3. Seasons

The earth not only spins about its axis but also moves round the sun. The earth's axis is not vertical. It is tilted at an angle. The movement of the earth round the sun causes different seasons.

Observe the above diagram carefully. When the northern hemisphere is inclined towards the sun, it receives more sun light. Hence there is summer. In summer the days are longer than nights. The sun rays fall directly on the surface of the earth. The land, air and water get heated by the sun.

When the northern part of the earth is inclined away from the sun, it receives less sun light. Then there is winter. In winter the days are shorter than nights. The sun rays do not fall vertically. So winter is cold.

When it is summer in northern part of the earth, it is winter in the southern part. When it is winter in the northern part, it is summer in the southern part.

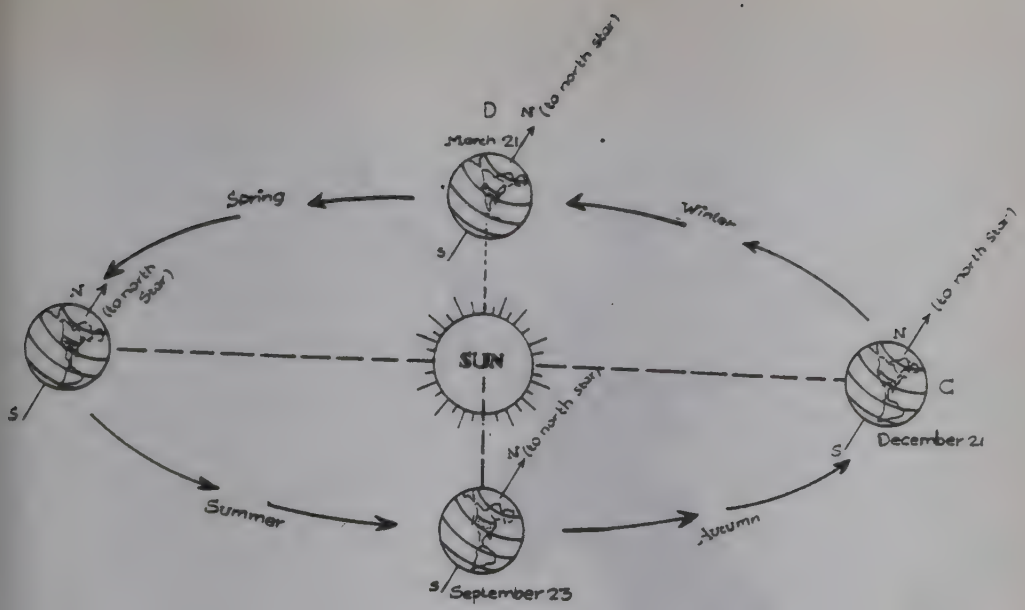

Fig. 7.3

Points to remember	
1.	The earth is one of the nine planets
2.	The earth revolves about its axis and causes day and night.
3.	The earth moves round the sun and causes seasons.

4. Satellites

The moon is a natural satellite of the earth. America, Russia and a few other countries have launched their own satellites into the space.

The Indian scientists have launched some satellites like Aryabhata, Rohini, Bhaskara and Insat into the space. They are artificial satellites. These satellites help us in many ways such as to forecast weather, to locate land use, forestry, minerals and water resources, and to show television programmes over distant places.

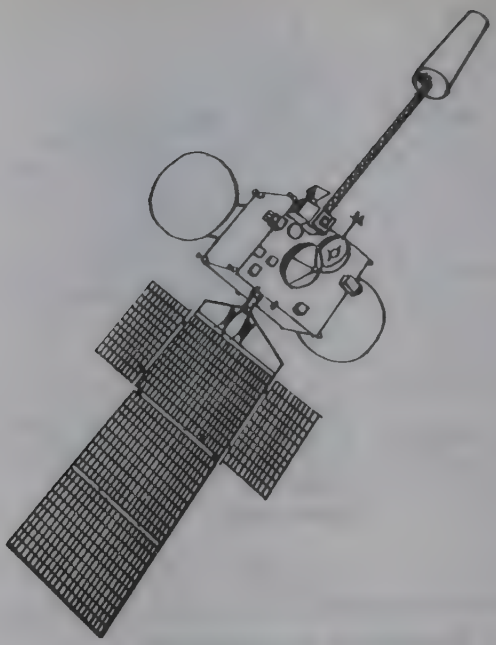

Fig. 7.4 Insat 2A

5. The moon

The moon is the nearest heavenly body to the earth. It has no light of its own. The moon reflects the light of the sun. The moon takes nearly a month to move round the earth once.

Activity 7.3 : Shut the doors and windows and make the room dark. Put a lamp on the table. Stand in the light of the lamp and hold the ball at arm's length. Your head represents the position of the earth and the ball represents the moon. Observe the light on the ball. The lamp represents the sun. When you hold the ball against the lamp you cannot see the lighted part of the ball. It is the position of new moon day. Turn slowly to left holding the ball. You can see more and more lighted portion. When you are holding the ball in the opposite direction of the lamp you can see the whole part of the ball lighted and it is the position of full moon day.

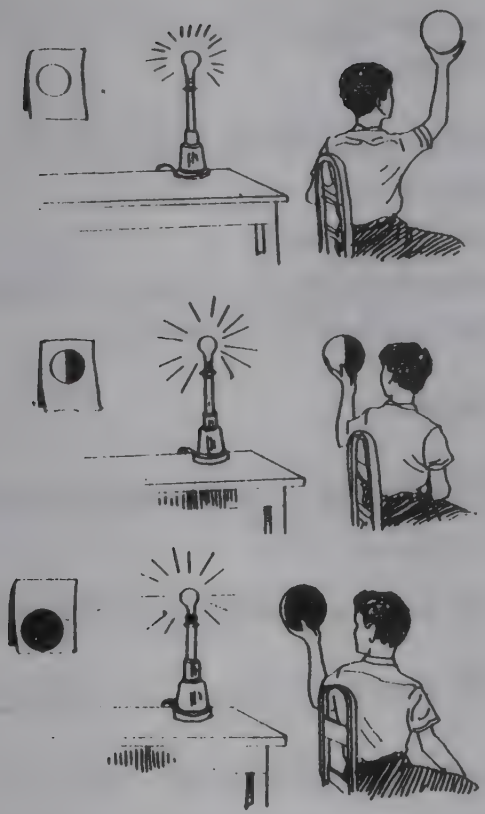

Fig. 7.5 Phases of the moon

In the same way the moon moves round the earth and we see different phases of the moon.

Points to remember	
1.	The moon is a natural satellite of the earth.
2.	Aryabhata, Bhaskara and Rohini and Insat are is sone of the artificial Indian satellites.

EXERCISES

I. Mark (✔) against the correct statement and (X) against wrong statement.

1. The objects which move round the sun are called satellites.
2. The sun is a star.
3. The moon is a planet.
4. The moon does not have light of its own.
5. The Insat is an artificial satellite.

II. Fill in the blanks

1. The path taken by a planet to move around the sun is called _____.
2. The earth turns around its axis and it causes _____.
3. The earth gets heat from _____.
4. The moon shines in full on _____ day.

III Four answer are given for each statement Underline the correct answer.

1. The solar system has

a) 6 planets b) 7 planets
c) 8 planets d) 9 planets

2. A planet is a body which moves round the

a) earth b) sun
c) moon d) satellite

3. The earth completes one rotation on its axis in _____.

   a) 20 hours b) 24 hours
   c) 28 hours d) 32 hours

4. The earth completes one revolution around the sun in _____.

   a) 12 months b) 10 months
   c) 8 months d) 6 months

5. Aryabhata is a

   a) Star b) Planet
   c) Artificial satellite d) Natural satellite

IV. Answer the following questions

1. What is a planet?

2. How does a satellite differ from a planet?

3. What is the effect of the earth's rotation around its axis?

Activities

1. Collect pictures of satellites.

2. Observe the picture of weather forecast in T.V.

3. Observe the moon daily and draw the different phases of the moon as you see.

SAVE FORESTS

SAVE WILD LIFE

SAVE INDIA

ಶಾಲಾ ಮಕ್ಕಳಿಗಾಗಿ ಪಠ್ಯ ಆಧಾರಿತ ಆಕಾಶವಾಣಿ ಕಾರ್ಯಕ್ರಮ :

ಪ್ರಸಾರದ ವೇಳೆ : ಪ್ರತಿ ಸೋಮವಾರದಿಂದ ಗುರುವಾರದವರೆಗೆ (ವಾರದಲ್ಲಿ ನಾಲ್ಕು ದಿನಗಳು) } ಅಪರಾಹ್ನ 2-30 - 3-00

ಮೂಲಭೂತ ಕರ್ತವ್ಯಗಳು

ಮೂಲಭೂತ ಕರ್ತವ್ಯಗಳು - ಪ್ರತಿಯೊಬ್ಬ ನಾಗರೀಕನಿಗೂ

(ಕ) ಸಂವಿಧಾನವನ್ನು ಅನುವರ್ತಿಸುವುದು ಹಾಗೂ ಅದರ ಆದರ್ಶಗಳನ್ನುಮತ್ತು ಸಂಸ್ಥೆಗಳನ್ನು, ರಾಷ್ಟ್ರಧ್ವಜ ಹಾಗೂ ರಾಷ್ಟ್ರಗೀತೆಯನ್ನೂ ಗೌರವಿಸುವುದು ;

(ಖ) ನಮ್ಮ ರಾಷ್ಟ್ರೀಯ ಸ್ವಾತಂತ್ರ್ಯ ಸಂಗ್ರಾಮಕ್ಕೆ ಸ್ಫೂರ್ತಿದಾಯಕವಾದ ಉದಾತ್ತ ಆದರ್ಶಗಳನ್ನು ಪೋಷಿಸುವುದು ಮತ್ತು ಅನುಸರಿಸುವುದು ;

(ಗ) ಭಾರತದ ಸಾರ್ವಭೌಮತ್ವವನ್ನು, ಐಕ್ಯತೆಯನ್ನು ಮತ್ತು ಅಖಂಡತೆಯನ್ನು ಎತ್ತಿ ಹಿಡಿಯುವುದು ಹಾಗೂ ಸಂರಕ್ಷಿಸುವುದು ;

(ಘ) ದೇಶವನ್ನು ರಕ್ಷಿಸಲು ಮತ್ತು ರಾಷ್ಟ್ರಕ್ಕೆ ಸೇವೆ ಸಲ್ಲಿಸಲು ಕರೆ ಬಂದಾಗ, ಹಾಗೆ ಮಾಡುವುದು ;

(ಙ) ಧಾರ್ಮಿಕ ಭಾಷಾ ಮತ್ತು ಪ್ರಾದೇಶಿಕ ಅಥವಾ ಜಾತಿ ಪಂಗಡಗಳ ಭಿನ್ನತೆಗಳಿಂದ ಅತೀತವಾಗಿ, ಭಾರತದ ಎಲ್ಲಾ ಜನತೆಯಲ್ಲಿ ಸಾಮರಸ್ಯವನ್ನು ಮತ್ತು ಸಮಾನ ಭ್ರಾತೃತ್ವದ ಭಾವನೆಯನ್ನು ಬೆಳೆಸುವುದು, ಸ್ತ್ರೀಯರ ಗೌರವಕ್ಕೆ ಕುಂದುಂಟು ಮಾಡುವ ಆಚರಣೆಗಳನ್ನು ಬಿಟ್ಟು ಬಿಡುವುದು ;

(ಚ) ನಮ್ಮ ಸಮ್ಮಿಶ್ರ ಸಾಂಸ್ಕೃತಿಯ ಭವ್ಯ ಪರಂಪರೆಯನ್ನು ಗೌರವಿಸುವುದು ಹಾಗೂ ಕಾಪಾಡುವುದು ;

(ಛ) ಅರಣ್ಯಗಳು, ಸರೋವರಗಳು, ನದಿಗಳು ಮತ್ತು ವನ್ಯಜೀವಿಗಳೂ ಸೇರಿದಂತೆ ನೈಸರ್ಗಿಕ ಪರಿಸರವನ್ನು ಸಂರಕ್ಷಿಸುವುದು ಹಾಗೂ ಮೇಲ್ಪಟ್ಟಿ ಮಾಡುವುದು, ಪ್ರಾಣಿಗಳಿಗೆ ಅನುಕಂಪ ತೋರಿಸುವುದು ;

(ಜ) ವೈಜ್ಞಾನಿಕ ಮನೋಭಾವನೆ, ಮಾನವೀಯತೆ, ಜಿಜ್ಞಾಸೆ ಮತ್ತು ಸುಧಾರಣಾ ಪ್ರವೃತ್ತಿಯನ್ನು ಅಭಿವೃದ್ಧಿಗೊಳಿಸುವುದು ;

(ಝ) ಸಾರ್ವಜನಿಕ ಸ್ವತ್ತನ್ನು ರಕ್ಷಿಸುವುದು ಮತ್ತು ಹಿಂಸೆಯನ್ನು ತ್ಯಜಿಸುವುದು ;

(ಞ) ರಾಷ್ಟ್ರವು ನಿರಂತರವಾಗಿ ಸಾಧನೆ ಮತ್ತು ಸಿದ್ಧಿಯ ಉನ್ನತ ಮಟ್ಟಗಳಿಗೆ ಬರುವುದಕ್ಕಾಗಿ ವೈಯಕ್ತಿಕ ಹಾಗೂ ಸಾಮಾಜಿಕ ಚಟುವಟಿಕೆಯ ಎಲ್ಲಾ ಕಾರ್ಯಕ್ಷೇತ್ರಗಳಲ್ಲಿ ಶ್ರೇಷ್ಠವಾಗಿ ಶ್ರಮಿಸುವುದು :-

(ಕರ್ತವ್ಯವಾಗಿರತಕ್ಕುದು)

ಶಾಲಾ ಮಕ್ಕಳಿಗಾಗಿ ಪಠ್ಯ ಆಧಾರಿತ ಆಕಾಶವಾಣಿ ಕಾರ್ಯಕ್ರಮ :
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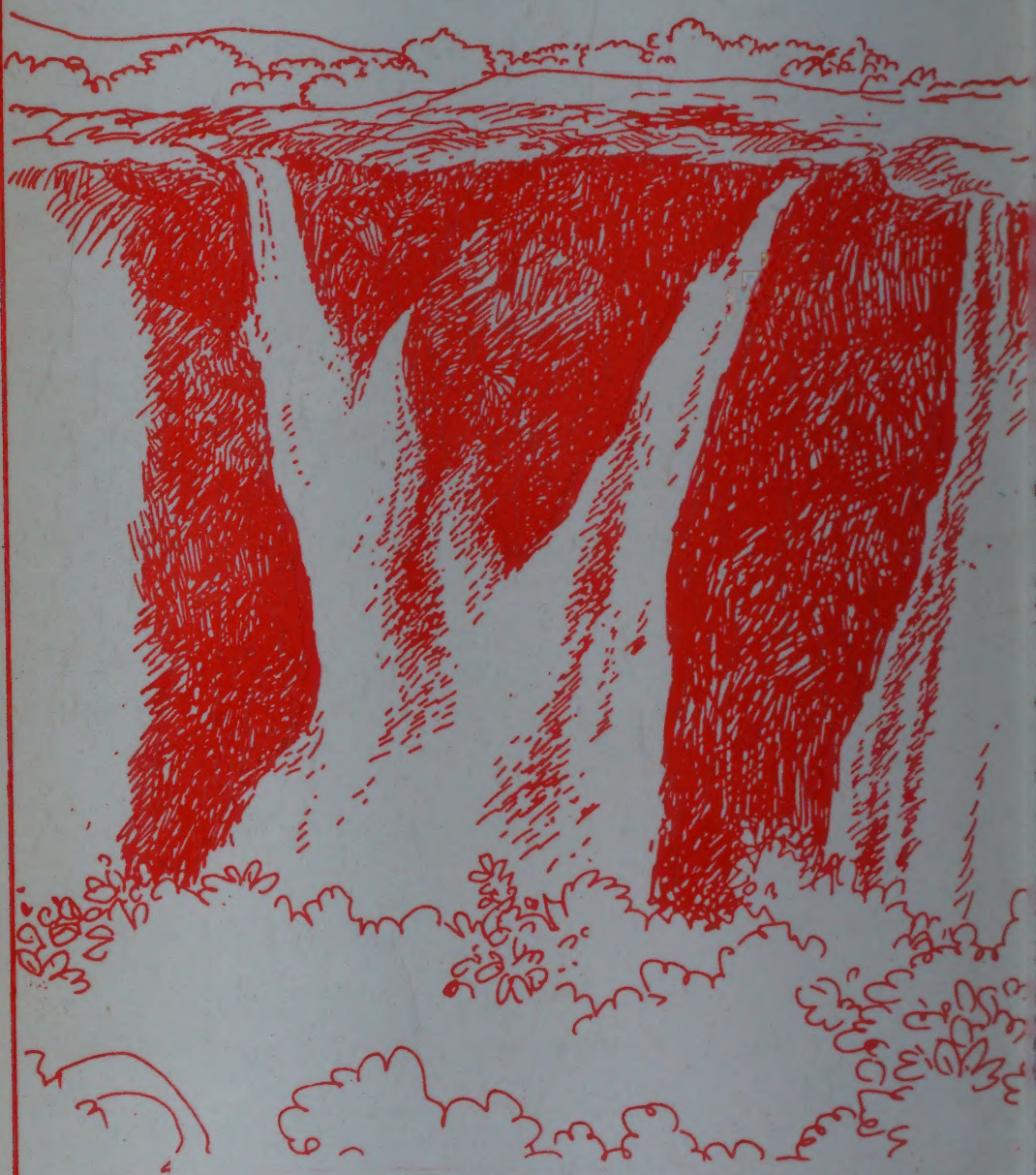

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